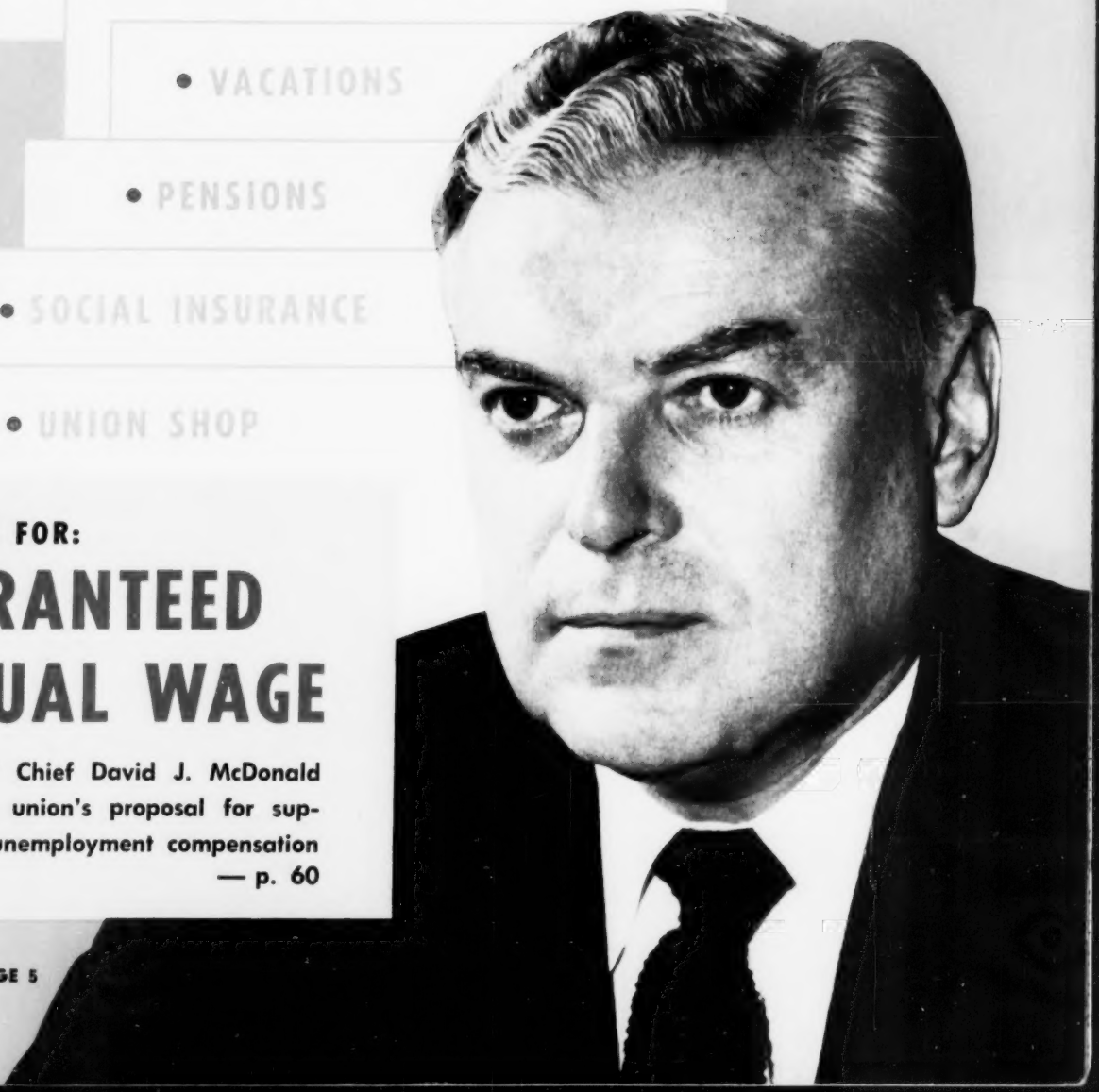
APRIL 5, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

- RECOGNITION
- MAINTENANCE OF MEMBERSHIP
- GEOGRAPHICAL WAGE DIFFERENTIALS
- CORRECTION OF INEQUITIES
- PAID HOLIDAYS
- VACATIONS
- PENSIONS
- SOCIAL INSURANCE
- UNION SHOP



THE CASE FOR:

# GUARANTEED ANNUAL WAGE

**Steelworkers' Chief David J. McDonald presents the union's proposal for supplementary unemployment compensation**
**— p. 60**

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**Take a closer look at**

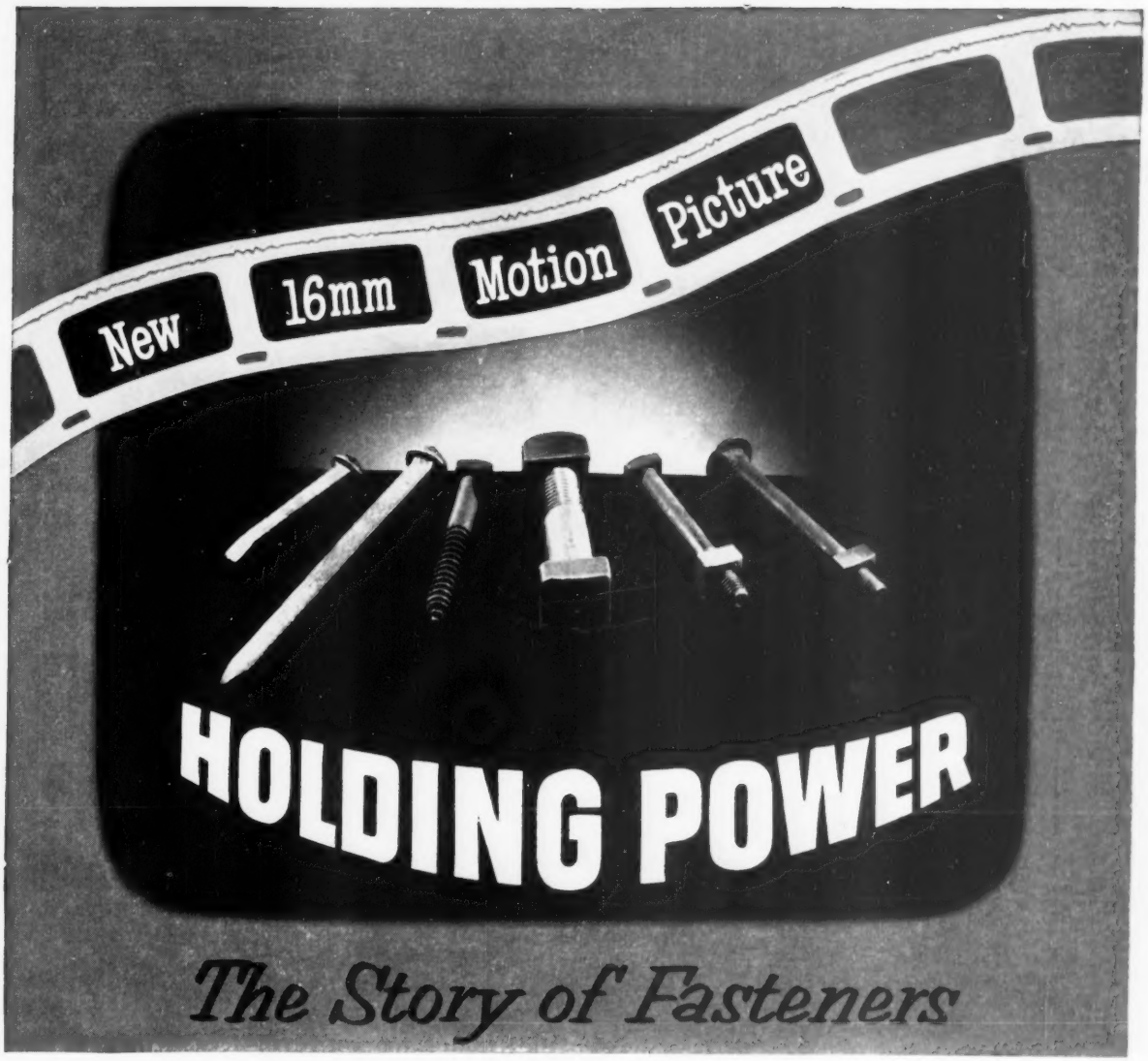
# Local Sources of Stainless Steel Tubing

You can put your trust in distributors of B&W stainless steel tubing. Their comprehensive stocks have all of the well-known qualities of B&W stainless steel tubing. B&W distributors enjoy complete support by the B&W technical staff. And B&W distributors' salesmen are trained to discuss your problems in your language . . . and to help you get the proper tube for your specific application . . . either from stock or direct from the mill.

B&W SEAMLESS and WELDED TUBES

**THE BABCOCK & WILCOX COMPANY**
***TUBULAR PRODUCTS DIVISION***
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-1814(G)




This important new film dramatizes the story of fasteners. It delves into such common, everyday items as machine bolts, nuts, rivets, track bolts and spikes, and also describes roof bolts, high-strength bolts, oil-well sucker rods, and a wide range of special fasteners. The film takes you behind the scenes in our modern fastener plants. It shows how fasteners are made, and explains the vital part they are playing in industry.

"Holding Power" is in color, with sound. It is on 16mm film, and has a running time of approximately 30 minutes.

"Holding Power" is an ideal film for showing to distributors, consumers, and others closely associated with fasteners. It is also an interesting, highly educational picture for general audiences. There is no charge, except for the return postage. If you would like a print for showing, fill out the coupon, selecting a date well in advance, and mail it to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

**BETHLEHEM STEEL**

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
*Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

*Gentlemen:*

*Please send me a print of your new film, "Holding Power." I will return it promptly, paying return postage.*

Approximate date wanted

Send Print to This Address

Name of Company or Organization

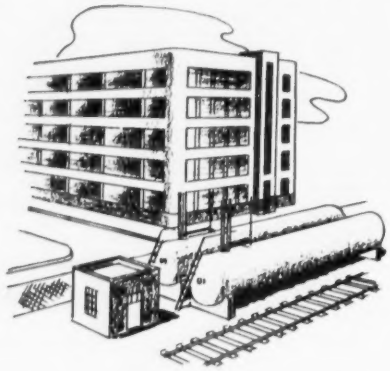
MY-26 Signature

Phillips 66

# Philgas*

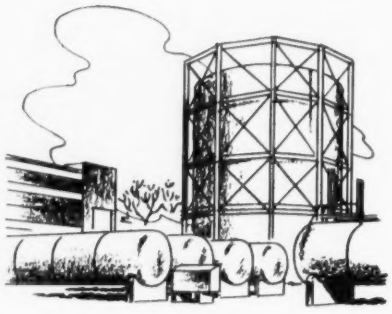
THE ALL-PURPOSE FUEL

## For Industries



Philgas, a clean, high-quality LP-Gas, is being used by leading industries for heat treating, mold drying, core baking, ceramic firing and many other operations. Philgas butane-propane systems are automatic, cutting down on overhead while assuring constant furnace temperatures, atmospheres, and pressures.

## For Utilities



Free from harmful contaminants, Philgas is used by many progressive utilities to augment supplies of natural or manufactured gas. Cleanliness, uniformity, constant pressures (high or low) and easy automatic operation make Philgas a *superior* product. It's America's largest selling brand of LP-Gas.

*Phillips *66* and Philgas are the Phillips Petroleum Company trademarks for its high quality propane-butane LP-Gas or bottled gas.

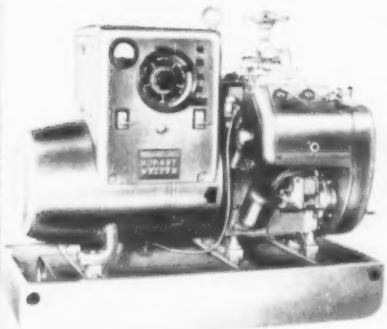
**PHILLIPS PETROLEUM COMPANY**

**Sales Department** **Bartlesville, Oklahoma**

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kan.

# Don't Overlook the advantages of the new HOBART arc welders

"Husky Boy" 200 Amp., Air Cooled Gas Engine



200 AMPERE
AC Welder—AC Power Combination

## Now, you can have AC WELDING and AC POWER

. . . ***FOR THOSE "BIG PAY" outside repair jobs.*** Furnishes emergency power for electric lights . . . operates power tools, motors, etc.

***Transformer Type AC Welder*** operates on single phase 220 volt power lines. A real welder for production and repair work.

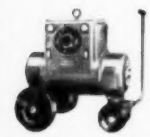
Rugged construction . . . advanced engineering . . . longer life . . . extra capacity . . . simplicity of operation . . . trouble-free service . . . that's why Hobart offers more for your money. That's why feature for feature Hobart will do a faster, better job at lower cost. These features, plus many more, are why Hobart is best qualified to give the lower costs and constant top performance so necessary to more profitable welding.

**HOBART BROTHERS COMPANY, BOX ST-44, TROY, OHIO, PHONE 21223**

*"One of the world's largest builders of arc welders"*

## HOBART TROY OHIO WELDERS

**a size and type for every welding requirement**



300 Amp. Electric Drive

300 Amp. Gas Engine Drive

200 Amp. Belted Generator

Welder with Auxiliary Power

Pipeliner Welder

A. C. Welder-AC Power Combination

Hobart Weldmobile

## A better general-purpose electrode

Right down to the stub a Hobart "10" electrode gives more welding ease and efficiency. An all-position DC electrode, it has a stable, deeply penetrating arc . . . deposits a smooth, flat bead of high tensile strength and ductility. Send for free samples.

• **HOBART BROTHERS COMPANY, BOX ST-44, TROY, OHIO, PHONE 21223**

Please send information on the items checked below:

☐ "Husky Boy" ☐ AC Welding—AC Power ☐ Transformer Type AC Welder ☐ Hobart Electrode Samples (Other) _____

**FREE**
Welders' Vest Pocket Guide

Name _____ Position _____

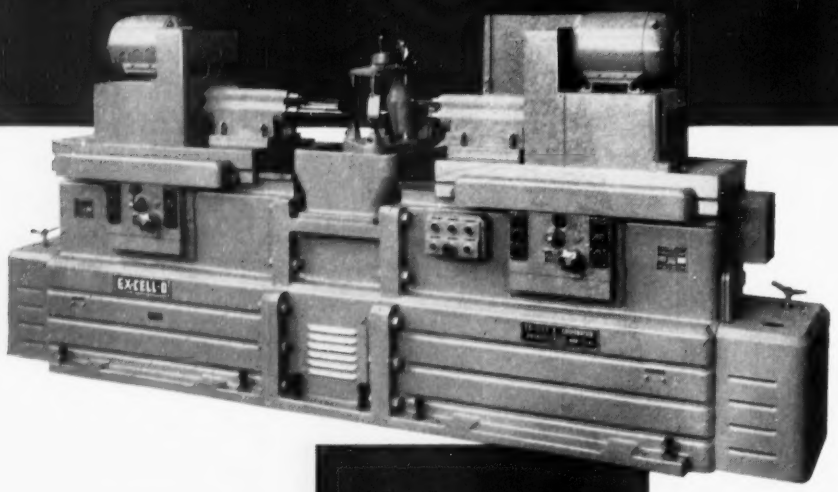
Firm _____

Address _____

# HOBART WELDERS, ELECTRODES

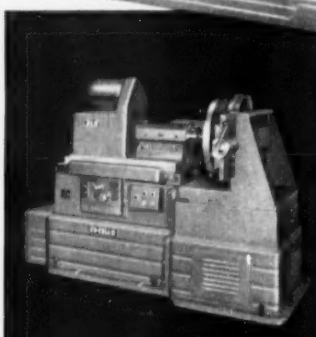
# Modernize Today for Profits Tomorrow

## WITH FAST, VERSATILE PRECISION WAY MACHINES

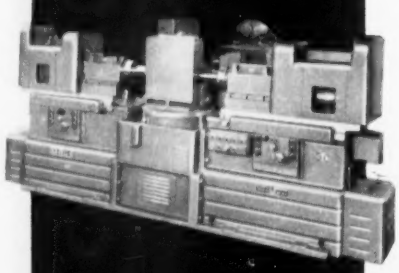


**STYLE 58 TWO-WAY:** Operates from a single push-button station. Handles large, heavy work. Fixture section can be designed to accommodate the way units from any angle.

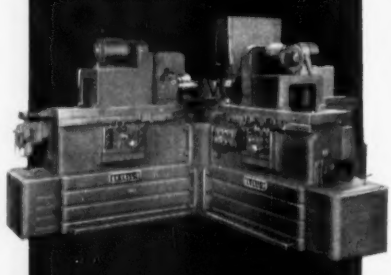
Units may be re-arranged around fixture or new fixture sections designed for different operations.



**STYLE 54 ONE-WAY:** A standard way unit combined with a fixture unit to suit the work. Large, heavy, and awkward parts, loaded in the fixture, remain stationary; the spindles advance to the work.



**STYLE 54 THREE-WAY:** Standard way units are electrically interlocked to operate simultaneously, or in any sequence. Fast and efficient for machining parts from three directions and holding accurate locations.



**STYLE 58 FOUR-WAY:** Controlled from a central push-button station. Particularly suitable for machining parts from four directions simultaneously, and performing progressive operations.

54-3

# EX-CELL-O

## WAY TYPE PRECISION BORING MACHINES ARE PROFIT INSURANCE

Way Machines perform such operations as precision boring, turning and facing. They consist of one or more standard way units combined with a fixture section. Each way unit has its own hydraulic system and controls to operate the spindle slide. Tooling and fixture are added to suit the individual operation. Get details from your Ex-Cell-O representative or write for Way Machine Catalog.

**EX-CELL-O**
**CORPORATION**
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES
CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS
AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

XLO
EX-CELL-O for PRECISION

*This Week in Metalworking*

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 14 April 5, 1954

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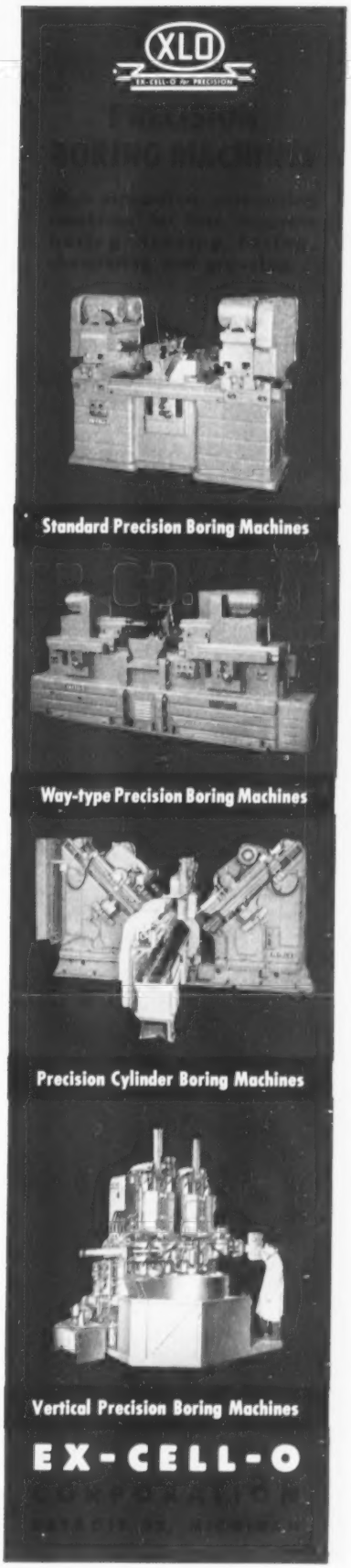


(Advertisement)

what's NEW in Engineering

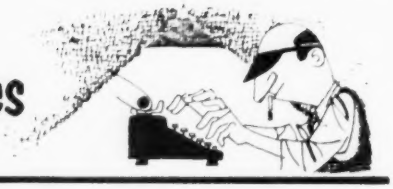
**A carbon dating process** developed by the University of Manitoba is said to make it possible to date—within 10 years of actual age—any matter containing radioactive carbon from as far back as 40,000 years. A liquid scintillator is used. The material to be dated is incorporated in the liquid. There it sets up light flashes which are measured by an electronic eye. The sample is destroyed in the testing process.

**Pre-cast, tilt-up** walls, soil testing and analysis, uniform spacing of bays and a dead level roof all played important roles in Kaiser Engineers' research, design and construction of Westinghouse's newest and largest—commercial lighting fixture plant. The result: a building suited in every respect for its intended purpose, and one constructed at an unusually low cost per square foot. For further information on this and other major Kaiser Engineers' projects, write us at the address below.

**A cold weather blow torch,** weighing just 6½ ounces, is claimed to operate efficiently at temperatures down to −70F. The torch pre-heats its own combustion air and a separate tank supplies fuel.

**Widely diversified** engineering talents and experience are available to every Kaiser Engineers' project. Departments include civil, structural, electrical, mechanical, architectural, process and production, mining and geology, metallurgical and chemical—and all work closely together. Call or write to Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

# behind the scenes



## Fructuous Contradictions

Didn't realize what we were letting ourselves in for when we published the puzzle of the crazy, mixed-up, cock-eyed woodpecker a couple of weeks ago. We've been getting answers everyday since . . . some long . . . some short . . . some clever . . . some (?) . . . all of them different but all of them correct.

May we thank all of you who took the time to reply. Didn't know we had so many BTS readers. We'd like to present one solution to the problem as representative of those submitted. It expresses our own sentiments exactly.

Solution: By Angus McAnderson, PhD, MSE (Mad Scotsman of Edinburgh), alias, F. C. Anderson of New Jersey.

I assume the wee bir-r-rd's pudenda to be undamaged by his sad accident.

And further that he is blessed with euspepsia, and there is no impediment to any rapid eructations that may be required.

By inspection I note that the solution will be single-valued and finite. Multiplying the efficiency by the square of the gross wages there results

$$(e)_i(g)^2 = egg$$

This is a step forward as I have now determined the sex of the little beastie.

Collecting constants,

u x s x t x n = n x u x t x s = NUTS

Now I am confused. I cannot be sure if I have two birds or one hermaphrodite. While I pondered these fructuous contradictions I was overcome by oscitancy and became dormient. It was then that the door to my office swung quietly open and ten long-bearded gentlemen filed in. As they seated themselves around my desk I at once recognized them as the Master Mathematicians of all time who, like true Guild brothers, were rushing to the assistance of a fellow member in distress.

Up spoke Euclid: "A straight line is the shortest . . ."

Einstein: "Pugh! Do you not read my monographs? There are no straight lines, only curves."

Descartes: "Gentlemen, gentlemen."

Aristotle: "Now you take Cleopatra. I always wanted to plot *her* curves."

Copernicus: "I once charted Venus. She was a slick chick."

Leibniz: "One, two, three, four, five, SEX. Why do we always get on that subject?

Newton: "Please, the situation calls for more gravity. Now my calculus of infinitesimal variations . . ."

Ibn Saud: "Infinitesimal, bah! *I* invented the zero."

Ling Chiu: "That's nothing. We Chinese have always known that."

Over in the corner Bertrand Russell was balancing himself on the shoulders of an apyretic little man and it was evident that the old pirate was walking the Plänck.

At that moment the door burst open and a division of hottentots marched in. With a well aimed volley of duodecimal radices they put the Masters to flight. After a lusty round of huzzas for their victory the leader, Alkh a' Seltza, unfolded a gleaming white parchment on which the answer to the problem was writ in letters of gold:

ONE-A-DAY

## A Tasty Sales Bit

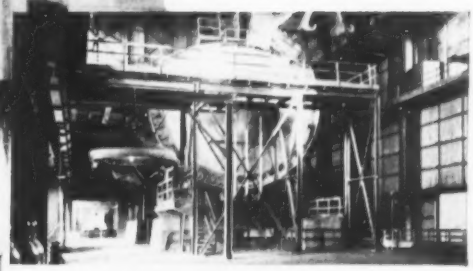
There is little doubt that sales management is hungry for material which will help it move more goods faster during 1954. Apparently STEEL's February article, "Now is the Time to Sell," was just the tasty morsel we had hoped it would be. This, the first in the 1954 Program for Management series, has already attracted requests for more than 5,000 reprints. The average request is for 25 copies. Other Program for Management articles on sales and related subjects are planned throughout the year. Look for these: June—Distribution, Integration Needed; July—Distribution, Training Personnel; August—Distribution, Transportation; and September—Product Diversification.

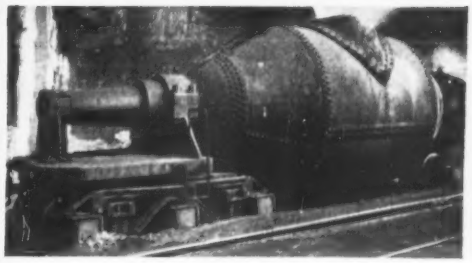
Shrdlu

(Metalworking Outlook—Page 49)

# A. P. GREEN
# KX-99

*In . . .*
**Complete Blast Furnace Linings**
**Hot Metal Mixers**
**Hot Metal Cars**





## Resist Carbon Monoxide Disintegration . . . Slag Action . . . Chemical Action and Abrasion

Fifteen leading steel companies have proved KX-99 Blast Furnace Brick in service. KX-99 were developed to meet the service requirements in the Steel Industry and are recommended for Complete Blast Furnace Linings, Hot Metal Mixers and Hot Metal Cars.

### Check These Outstanding Properties of KX-99

1. **Special high fired, Missouri super duty brick.**
2. **No sign of carbon monoxide disintegration in 1000 hour test at 900°F.**
3. **Apparent porosity in the range of 8 to 12 per cent with an average of 10 per cent.**
4. **Bulk density in the range of 2.30 to 2.40 grams per cubic centimeter.**
5. **Average modulus of rupture 1800 to 2500 pounds per square inch.**

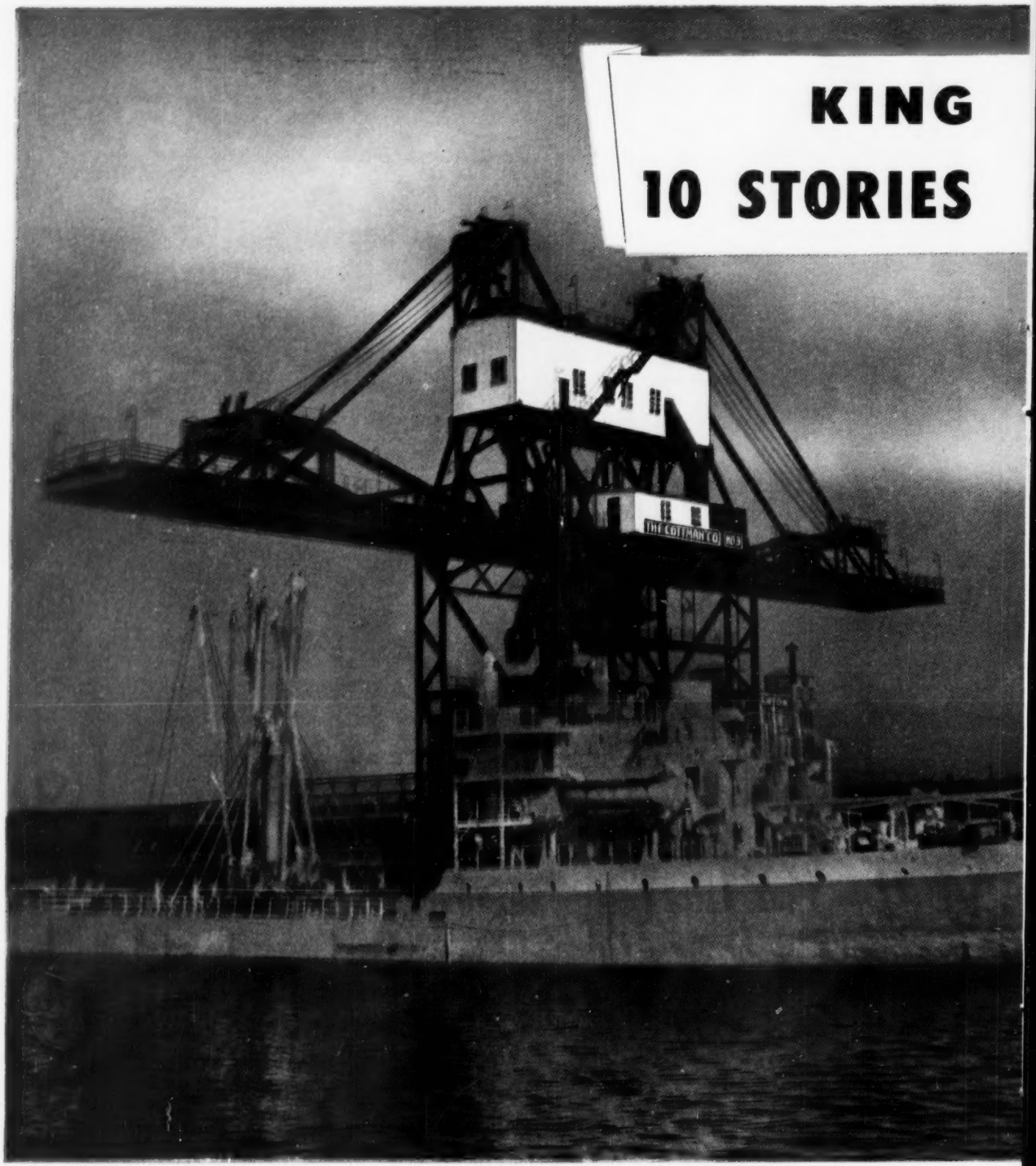
*For detailed information on service and specific recommendations—contact your local A. P. Green Representative or write*

*KX-99 Blast Furnace Brick are manufactured to extremely close tolerances . . . uniform in dimensions . . . free from warpage.*

A. P. Green REFRACTORY PRODUCTS

**A. P. GREEN FIRE BRICK COMPANY**
Mexico, Missouri, U. S. A.
*In Canada*
A. P. Green Fire Brick Company, Ltd.
Toronto 15, Ontario

A COMPLETE LINE OF FIRE-CLAY REFRACTORIES




Ore Bridges
Railroad Car Dumpers
High Lift-Turnover-Rotary
Coal Preparation Plants
Coal & Coke Handling Equipment
Boat Loaders & Unloaders

Rotary Mine Car Dumpers
Coal Crushers
Coal Storage Bridges
Car Hauls & Boat Movers
Bradford Breakers
Refuse Disposal Cars
Thorsten Coal Sampling Systems

Kinney Car Unloaders
Pig Iron Casting Machines
Cyclone Thickeners
Thermal Dryers
Reineveld Centrifugal Dryers
Olivo Moisture Meters

# OF THE EASTERN SEABOARD
# HIGH and HALF A BLOCK LONG

## THIS MAMMOTH UNLOADING TOWER...

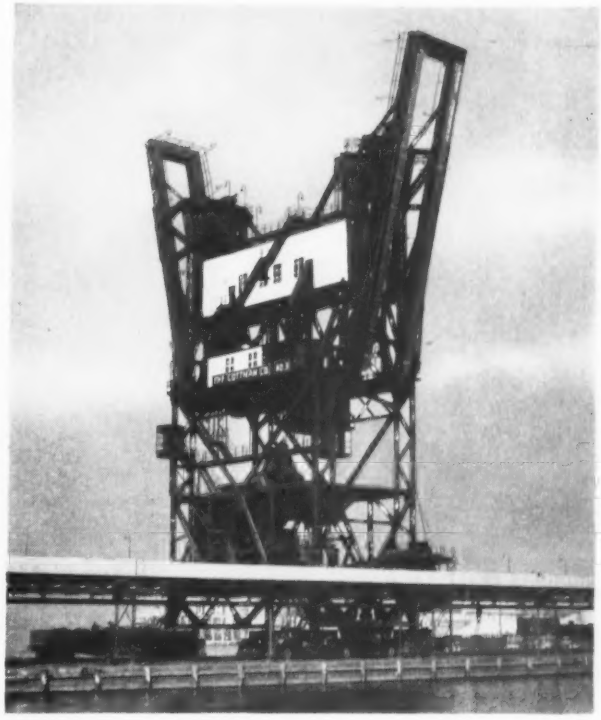
. . . the fastest ship unloader on the East Coast . . . recently began operations for the Cottman Company at the Canton Railroad Pier, Baltimore, Md.

Designed, fabricated and erected by Heyl & Patterson, Cottman Unloader #3 is the last word in engineering design . . . as modern as next week.

This giant installation again reflects the aim of Heyl & Patterson . . . to work hand-in-hand with the customer to design and build the world's finest Heavy Bulk Materials Handling Equipment.

A contract placed with Heyl & Patterson means just one responsibility for the entire job because we have our own Engineering Department . . . our own Research Department . . . our own Structural Shop . . . our own Machine Shop . . . our own Service Department . . . and our own Erection Department.

When your problem concerns the loading, unloading or transfer of any Heavy Bulk Material, you can depend on Heyl & Patterson to solve it.



## FACTS and FIGURES about this NEW HEYL & PATTERSON UNLOADING TOWER

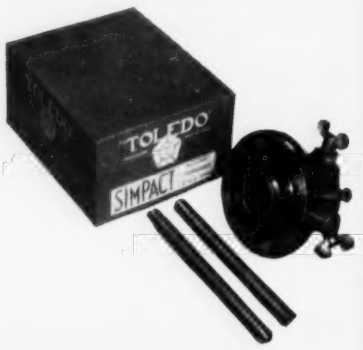
- This new unloader reaches 147 feet above the pier and spans 267 feet between the tips of the two aprons.
- This unloading tower has a maximum or free-digging capacity of 1900 tons per hour.
- The latest engineering and construction designs in this unloader include:
  - Adjustable D.C. voltage control for smoother, better-controlled operation of bucket hoist, trolley and tower travel motions.
  - Turn-table trolley which enables the bucket to dig from any angle in the hold of a ship.
  - Power-operated Heyl & Patterson Rail Clamps installed for added safety.
- The unloader can travel the entire length of the 1250 ft. pier to unload ships from any spot.
- Ships can be unloaded from either side of the pier.
- Ore can be discharged either into railroad cars on the pier tracks or onto a conveyor belt system.
- When traveling, the aprons of the unloader can both be raised to clear the superstructure of ships.
- This is the second Heyl & Patterson unloader now operating on the Canton Railroad pier.
- This new unloader can unload more ore per hour than the combined efforts of the other two unloaders on the pier.

**Heyl & Patterson, Inc.**
"SINCE 1887"

**Heavy Bulk Materials Handling Equipment**
*All the Way from Design to Erection*

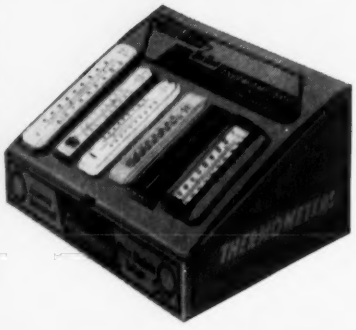
55 FORT PITT BLVD. PITTSBURGH 22, PA.

ECONOMICAL
PROTECTION




PROMINENT
IDENTIFICATION

SALES-WINNING
PROMOTION



Write for booklet, "How To Merchandise With Corrugated Boxes." Hinde & Dauch, Sandusky 47, Ohio.

HINDE & DAUCH
Authority on Packaging

# LETTERS
## TO THE EDITORS

### Building Better Bosses

May we have a reprint of your article "Management Development" (Mar. 22, p. 81), No. 2 in the 1954 Program for Management. We certainly read your articles with interest and would like to pass this one on to a friend overseas.

H. Kern
American Saar Steel Corp.
New York

### No. 1 Business Problem

If you still have copies of "Now You Have To Sell" (Feb. 22, p. 91), No. 1 in the 1954 Program for Management series, we would like very much to obtain 24 copies.

Tom G. Winterton
Latrobe Steel Co.
Latrobe, Pa.

. . . we would like to have 38 additional copies so that the general manager of each DoALL store in the country may have the opportunity to read it.

V. Bond
DoAll Co.
Des Plaines, Ill.

. . . please send 50 reprints.

J. D. Allan
sales manager machine tools
Pratt & Whitney Division
Niles-Bement-Pond Co.
West Hartford, Conn.

The content of this installment is highly regarded. We would like to have 12 additional copies for distribution to a few of our sales representatives who could learn much from the article.

Don C. Stablein
general sales manager
K-O-Lee Co.
Aberdeen, S. Dak.

. . . a dozen copies would be greatly appreciated.

J. F. Miller
assistant general sales manager
Hartford Machine Screw Co.
Hartford, Conn.

There has been much material written along this line in the last several months, but this is certainly the best article by far which we have seen.

C. F. McGinnis
assistant sales manager
Ridgway Division
Elliott Co. Inc.
Ridgway, Pa.

Your series, Program for Management, has been a most interesting and informative one. Your fine organization is to be complimented on this most timely series.

These are not times to inquire: "How's your business?" Rather: "What are you doing about your business?" is what a salesman should use as an opening remark.

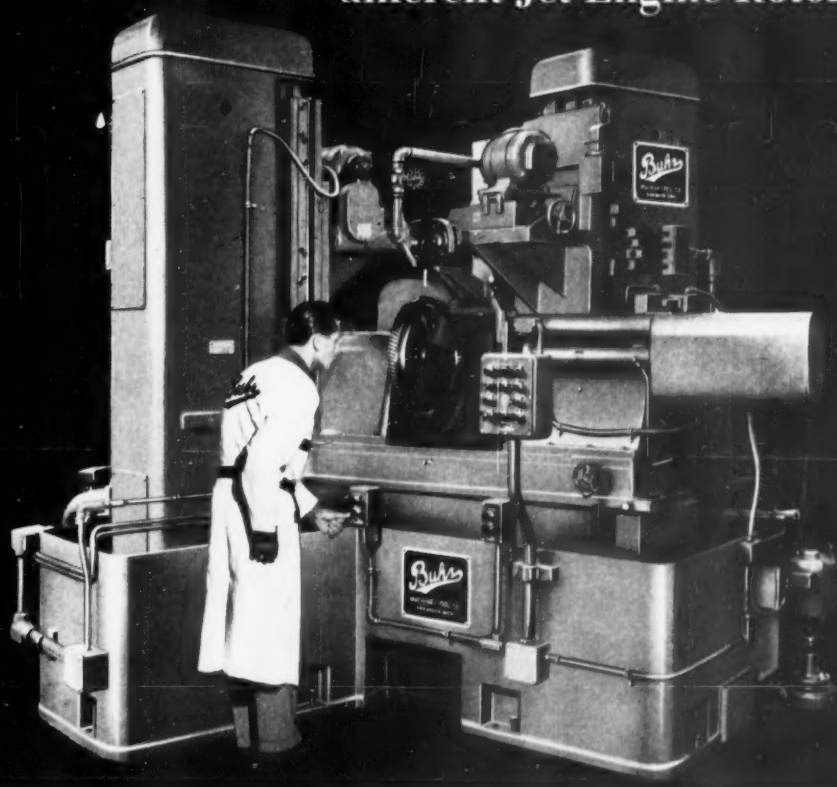
D. E. MacLean
vice president-sales
Lava Crucible Refractories Co.
Pittsburgh

Recently I had an opportunity to read "Now You Have To Sell," No. 1

*(Please turn to page 12)*

# Buhr SPECIAL...

## Mills both ends of 57 up to 103 slots in 16 different Jet Engine Rotors



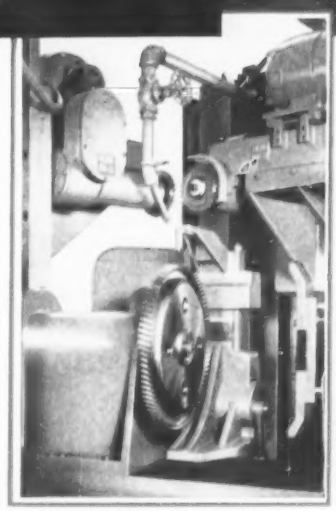

Automatic 2-spindle milling machine, arranged with automatic index for milling both ends of dove-tailed slots.

Equipped with hardened and ground laminated tool-steel ways.

Hydraulic and electrical installations to J.I.C. standards.

Automatic index unit arranged for milling the various stages from 57 up to 103 slots.

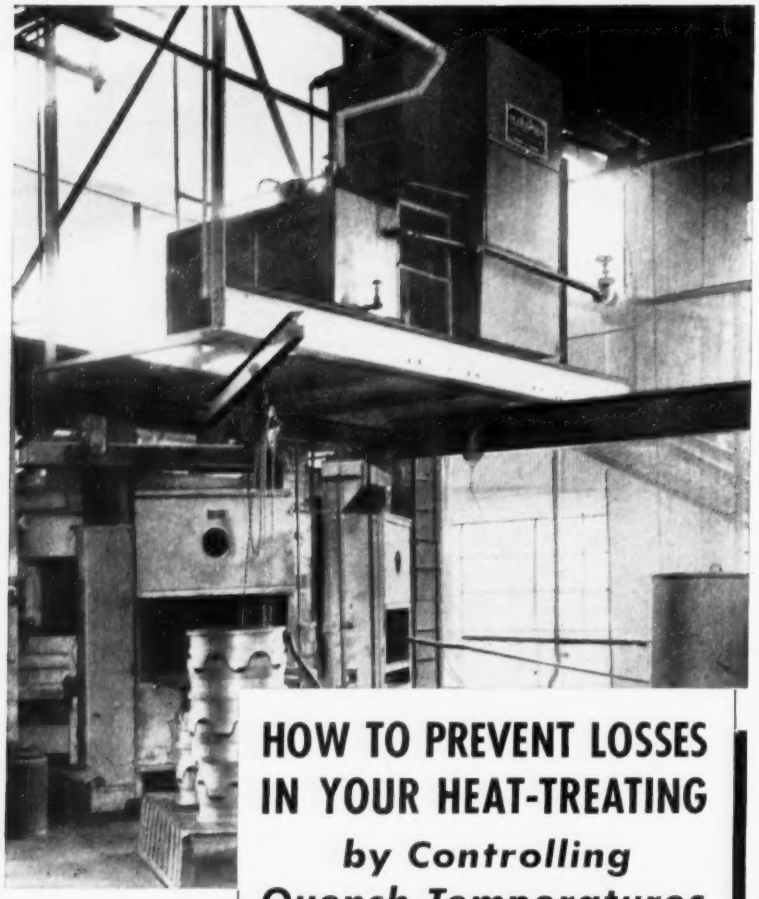
Once machine is set up for any one part, operation is fully automatic, including stop when part is finished.



**BUHR MACHINE TOOL CO.**
ANN ARBOR, MICHIGAN

Buhr

**MULTIPLE-SPINDLE HIGH PRODUCTION MACHINERY**



**HOW TO PREVENT LOSSES IN YOUR HEAT-TREATING**
***by Controlling Quench Temperatures***

● Using Niagara's AERO HEAT EXCHANGER to cool your quench bath never fails to give you real control of the temperatures at which you wish to quench.

Your experience will be the same as others who have installed this method. You'll get better physicals; save losses and rejections; increase heat-treating capacity and production with lower costs. You can put back heat into the quench bath to prevent the losses of a "warm-up" period. You remove heat at the rate of input and prevent flash fires in oil quench baths.

You'll save space in your heat treating department and get a more productive arrangement because less room is needed for coolers and tanks. You'll find savings in piping, pumping and in the amounts of oil you will have to buy. And the saving in the cost of cooling water alone is enough to repay the cost of the Niagara Aero Heat Exchanger, usually in less than two years.

*Write for Bulletin 120 and further information*

**NIAGARA BLOWER COMPANY**

Dept. S, 405 Lexington Ave. New York 17, N. Y.

*Niagara District Engineers in Principal Cities of U. S. and Canada*

**INDUSTRIAL COOLING HEATING • DRYING**
**NIAGARA**
**HUMIDIFYING • AIR ENGINEERING EQUIPMENT**

# LETTERS

*(Concluded from page 10)*

in the 1954 Program for Management.

I have since been told of the fine series of articles you ran in the 1953 Program for Management. Would it be possible for me to obtain a copy of each of the ten articles in that series?

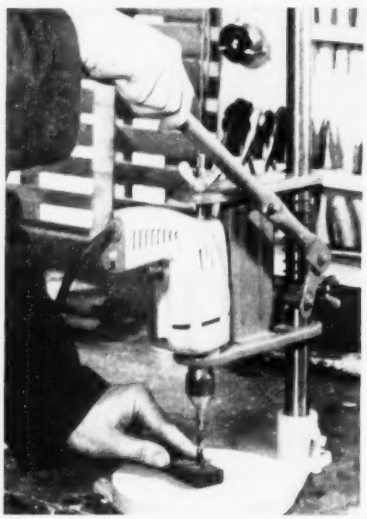
Leo J. Boettner
staff auditor
Crucible Steel Co. of America
New York

The article is very interesting and especially appropriate at this time. If you have sufficient copies, I would appreciate receiving 27 so one can be sent to each of our branch office managers.

H. M. Hammond
vice president
Bailey Meter Co.
Cleveland

● *Being sent.—ED.*

## Warning: Unsafe Procedure



I want to call your attention to an example of poor safety practice in photo illustrating article "You, Too, Can Do It Yourself" (Mar. 1, p. 54).

It is too bad that the hobbyist shown drilling a small piece of steel did not use a vise or a vise grip or even pliers to hold the work. I have seen three bad hand injuries in my shop as a result of operators trying to drill work as illustrated . . .

R. S. Kling
431 Kingshighway
Westport, Conn.

## Fine Job on Turnover Story

I thought you did a fine job on your labor turnover story, "Cut Labor Turnover Costs" (Feb. 15, p. 78).

R. S. Livingstone
vice president—human relations
Thompson Products Inc.
Cleveland

## Noise Problem Gets Hearing

Please send a set of tear sheets of "It's Time To Give Noise a Hearing."

W. N. Davis
American Foundrymen's Society
Chicago

...solid foundation
FOR TODAY'S COMPACT MOTOR DESIGN
There are, as you know, new NEMA Standards for electric motors ... more power in less space.
When you look for a new NEMA frame motor, look for the one that is built on a solid foundation ... it carries the Fairbanks-Morse Seal of Quality.
The Standards are new . . But the Idea Is Not
Like the recent Fairbanks-Morse developments in other lines, the new F-M motor is the result of a basic engineering philosophy: More Performance in Less Space—a 120-year tradition at Fairbanks-Morse. Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois
FAIRBANKS-MORSE
a name worth remembering when you want the best
ELECTRIC MOTORS AND GENERATORS • DIESEL LOCOMOTIVES AND ENGINES • PUMPS • SCALES • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS
NEW LOCOMOTIVE DESIGN
NEW GENERATOR DESIGN
NEW SCALE DESIGN
NEW DIESEL DESIGN
NEW MOTOR DESIGN
NEW PUMP DESIGN
NEW MAGNETO DESIGN

# *You get*
# "National Network Service"
## *when you hook up with a*
# Morse-Franchised Distributor

The five Morse warehouses are linked together with the Morse plant in a complete teletype network, coast to coast. And this instant, constant communication means that your Morse-Franchised Distributor is able to give you top-speed service no matter what your cutting-tool needs may be at any moment . . . and no matter whether the particular tools you need are available right at that moment at any single stock-point. He knows how to find them fast, and get them to you "quickest way". And that goes for the complete line of the finest cutting tools made . . . Morse Drills, Taps, Dies, Reamers, End Mills, Counterbores and Milling Cutters. *So always call your Morse-Franchised Distributor.*

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASSACHUSETTS
*(Division of VAN NORMAN CO.)*
*Warehouses in New York, Chicago, Detroit, Houston, San Francisco*

*San Francisco*
**TWX No. SF-1068**

# MORSE

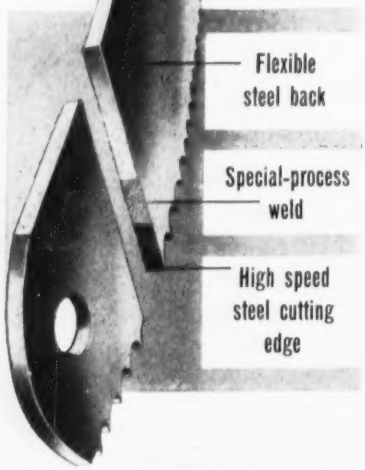
## Cutting Tools

*Buy them by phone from your Morse-Franchised Distributor and save ordering time*

USE

# Victor

unbreakable high speed blades




**COMPETITIVELY PRICED**

For safety, Victor High Speed Flexible Blades are shatterproof. And, like *all* Victor Blades, they are made by exclusive processes, with special machinery, to unequalled quality standards, and remember, no premium price.

Your Victor distributor is the man to call, for Victor Hack Saw Blades and for the other tools and supplies he carries. We have selected him with care — for complete inventories, swift deliveries, helpful service, and quality products.

*Sold Only Through Recognized Distributors*

VICTOR

**SAW WORKS, INC. • MIDDLETOWN, N.Y., U.S.A.**

*Makers of Hand and Power Hack Saw Blades; Frames; Metal & Wood Cutting Band Saw Blades.*



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*Seamless and welded tubing*
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***cut to your multiple lengths***

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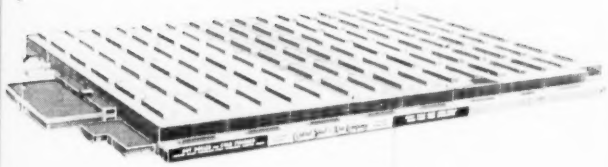
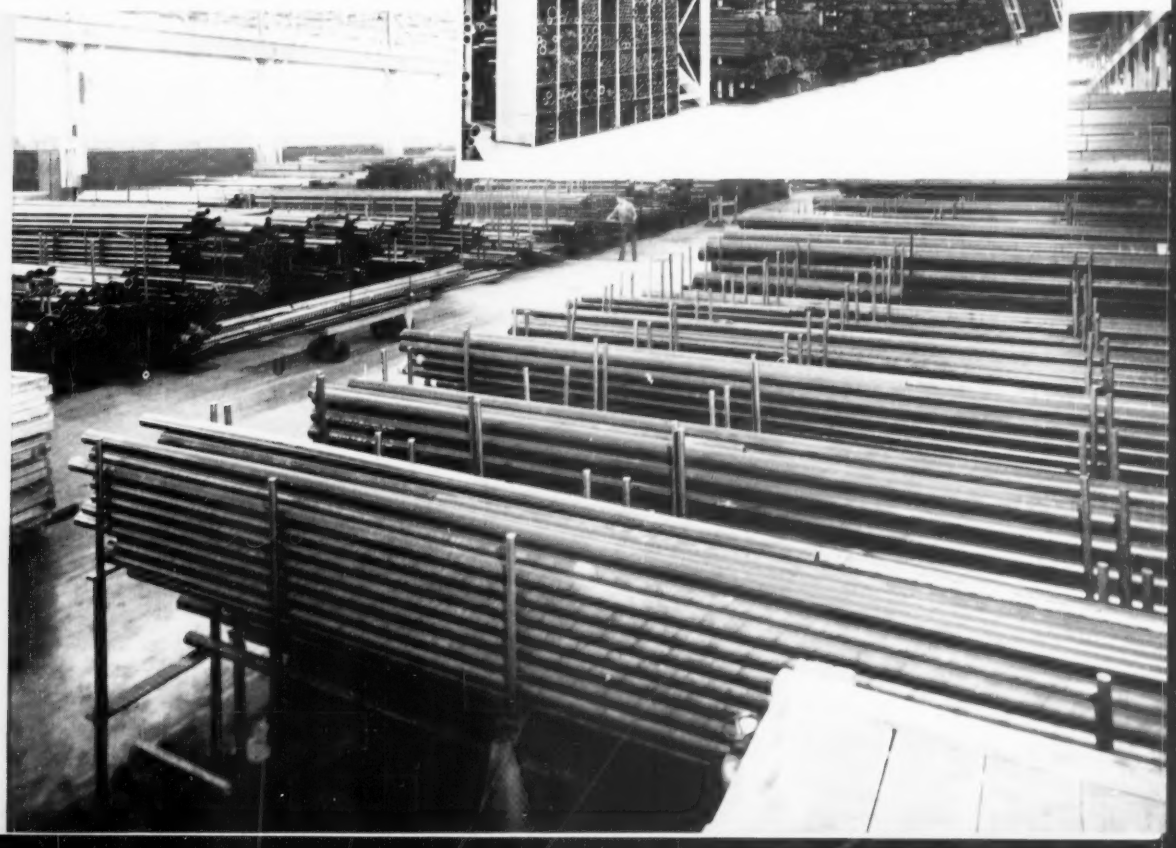
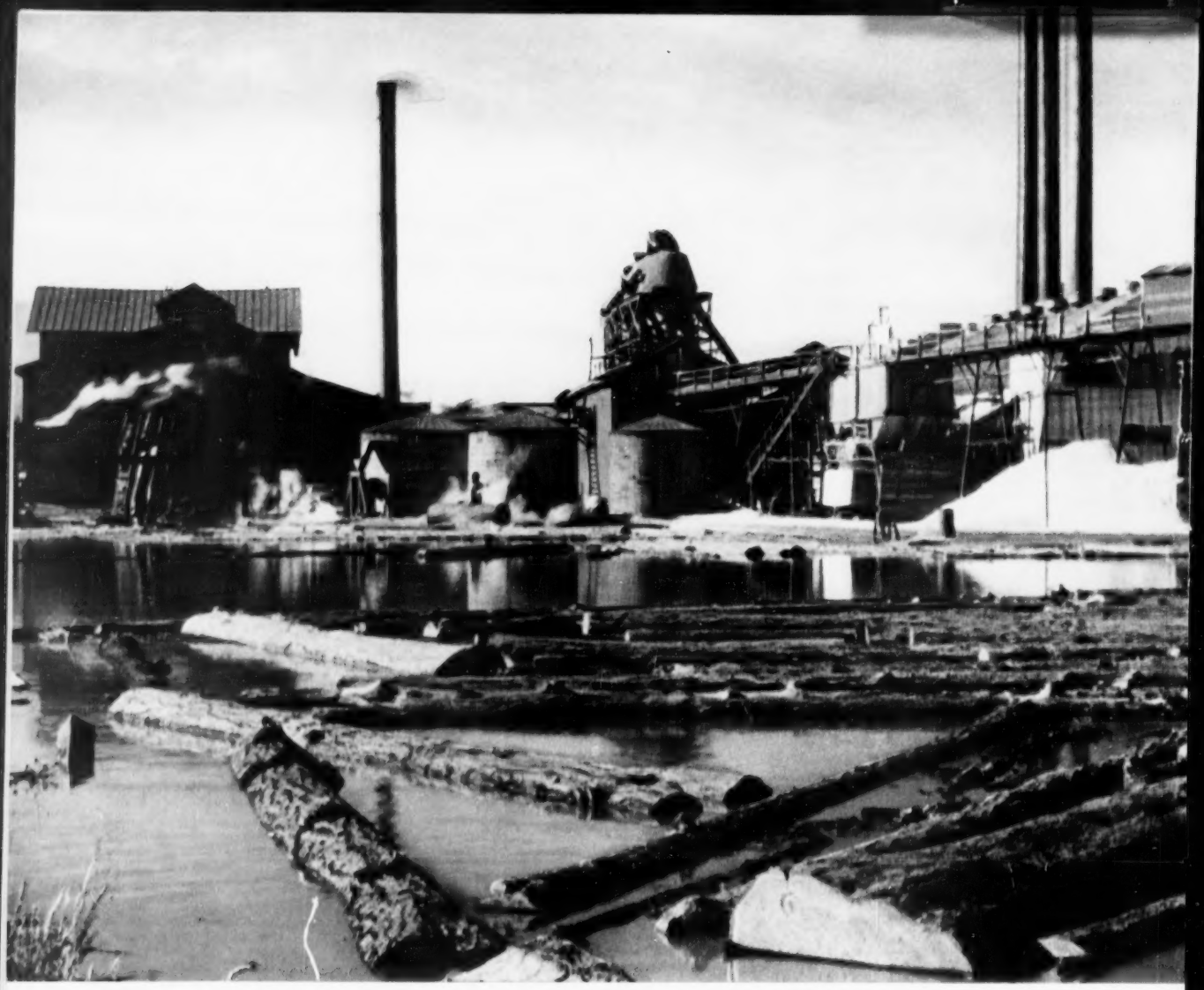






Western Pine Sawmill in Arizona — FPG Photo

BULLARD

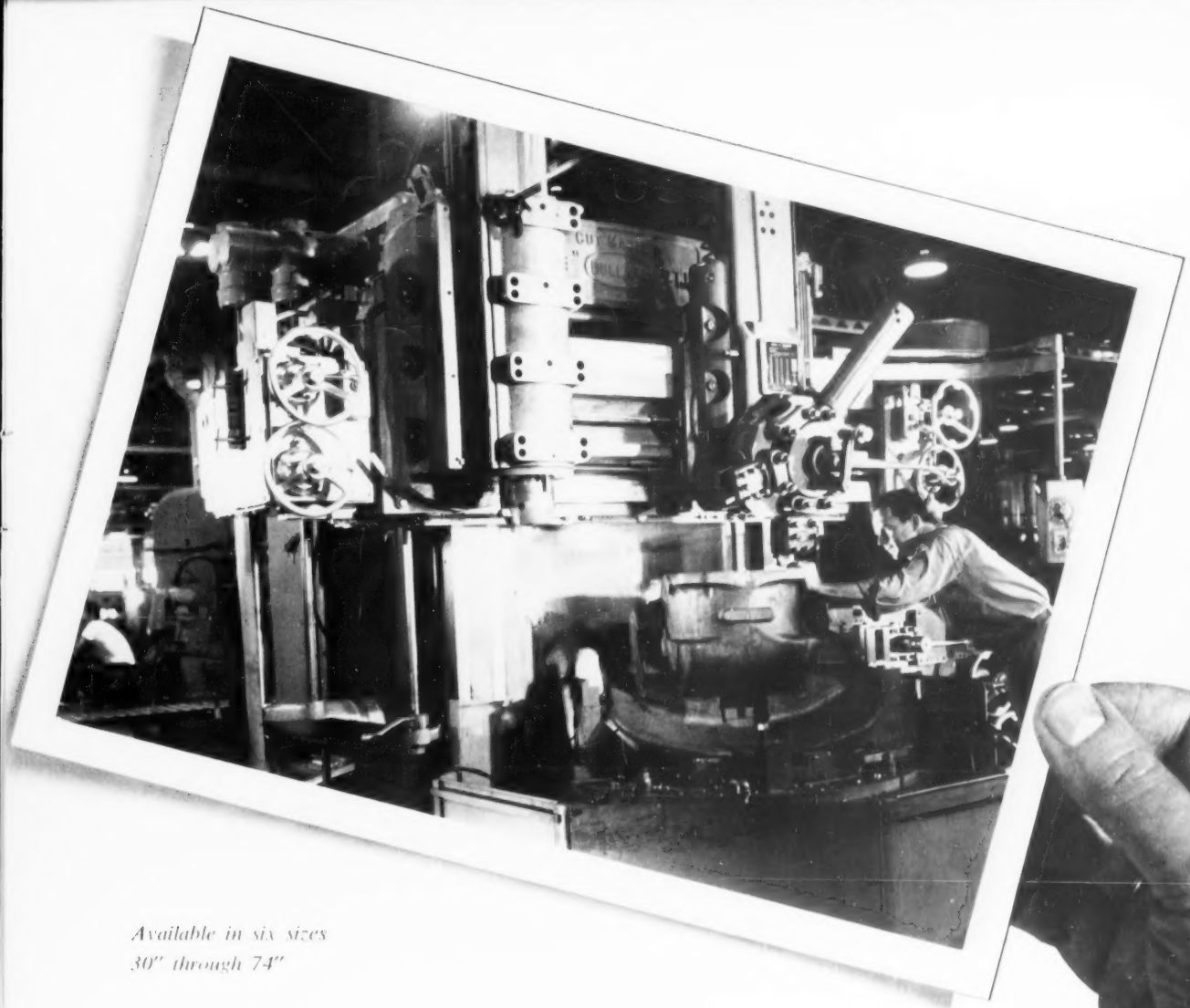
# The Invisible Background of Industrial Progress

When most of us think of Arizona, "The Grand Canyon State," we are reminded of its dry climate, rich mineral mines, rodeos, Hoover Dam, the greatest man-made water barrier in the world, and nature's wonderful spectacle, The Grand Canyon.

Yet, there are 3,607,000 acres of available commercial timber in Arizona which includes Douglas and White Fir, Engelmann's Spruce and Ponderosa or Western Yellow Pine. Ninety percent of this forest acreage is in Ponderosa Pine which is converted to a soft, fine-grained, inexpensive wood — in great demand for sashes and doors, flooring and general millwork.

As an efficient method of manufacturing for builders of material handling equipment for the lumber industry, *Modern Machine Tools* are indeed "The Invisible Background of Industrial Progress."

**THE BULLARD COMPANY • BRIDGEPORT 2, CONNECTICUT**

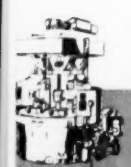


*Available in six sizes*
*30" through 74"*

Vision is indispensable to industrial progress. Are you planning today for tomorrow's needs? If you are, you must pay particular attention to the machine tool requirements of your plant to meet the standards of today's manufacturing efficiency.

The Bullard Cut Master Vertical Turret Lathe is a machine designed for cutting time on cuts as well as cutting time between cuts. Truly everything its name implies — and more. Designed to give maximum production on short or long runs by controlled accuracy, necessary rigidity and metal-removing ability.

It will pay you dividends for years to come. For the entire cost-saving, money-saving story, call your Bullard representative or write to The Bullard Company, 286 Canfield Avenue, Bridgeport 2, Connecticut — phone 6-2511.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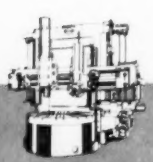
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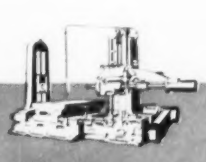
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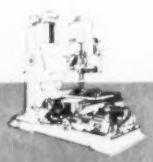
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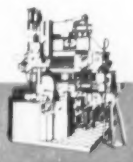
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MULT-AU-MATIC

BULLARD

# REPUBLIC ELECTRO PAINTLOK
## provides a fine, long-lasting finish

The Mills Company, Cleveland, uses Republic Electro Paintlok in fabricating doors, fronts and panels for their Marblmetal line of toilet compartments. Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers and synthetic enamels, and to hold them for years.

In addition to providing a smooth, lasting finish, Electro Paintlok affords this company other advantages and economies:

1. There is no cracking, flaking or peeling during fabricating or finishing operations. Electro Paintlok forms easily.

2. The zinc coating guards against underfilm corrosion should painted surfaces become scratched.

3. Only a simple cleaning with a water-soluble cleaner is needed to prepare Electro Paintlok for application of the baked-on enamel finish.

4. Surfaces are pre-conditioned for applying the baked-on enamel finish. No pre-etching is required.

Write for Republic Booklet 525. It tells the complete story on how Electro Paintlok can add eye appeal to your fabricated steel products.

**REPUBLIC STEEL CORPORATION**
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept., Chrysler Bldg., New York 17, N. Y.

REPUBLIC STEEL

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**ELECTRO ZINC PLATED SHEETS**
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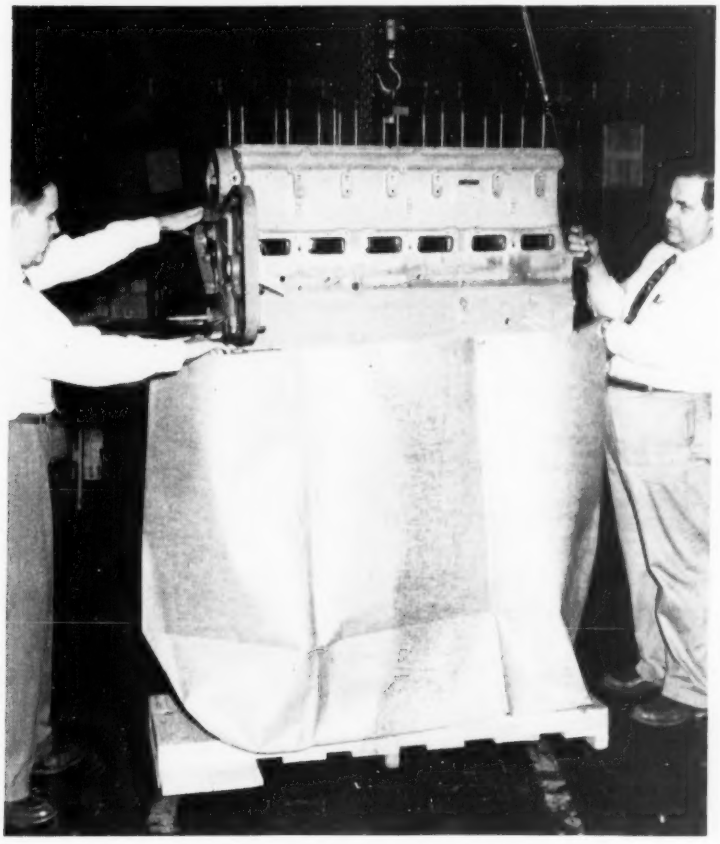
**Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron**

# *Vapor-from-paper* stops rust!
# Cuts labor 58% at Cummins



Here's a quality diesel engine that runs into a lot of money. So nobody runs the risk of letting rust ruin it.

That's how the big paper bag got into the picture at Cummins Engine Co.

It's made of Angier VPI Wrap. And it gives off a vapor inside that keeps the engine corrosion-free. There is no slushing to do.

Cummins tells its Angier serviceman that small engine heads used to get *three* oil baths. Now they need none. Before VPI, one head used to ship in a heavy wooden box. Now, *three* units go in one light wire bound.

This cuts freight costs. But the *big* savings are in time and labor — 58%, as the chart in the top photo shows.

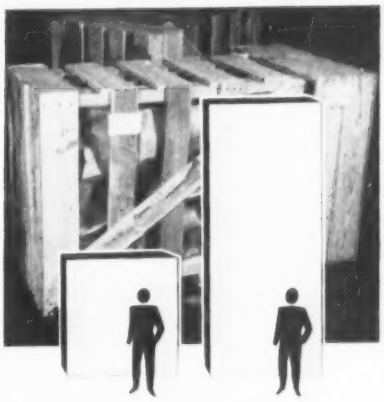
Angier VPI® can help you, too. To get positive corrosion insurance at low cost, look to Angier, most *experienced* name in vapor rust prevention.

®g. Vapor rust preventive. Angier VPI Wrap (2 grain) is made to conform to the government's specification on volatile rust inhibitors—MIL P 3420.

## Most *Experienced* Name in Vapor Rust Preventives

Angier

Protective papers for industrial, building, farm needs since 1895. Distributors in Principal Cities.



**Before VPI—22,973 lbs. With VPI—54,615 lbs.**

*(amount shipped for every 1 man in dept.)*

This is how Cummins cut costs when Angier's vapor method replaced slushing oils and dip tanks. With VPI, men have a cleaner, safer place to work. And customers have no degreasing to do — a real sales advantage for Cummins.

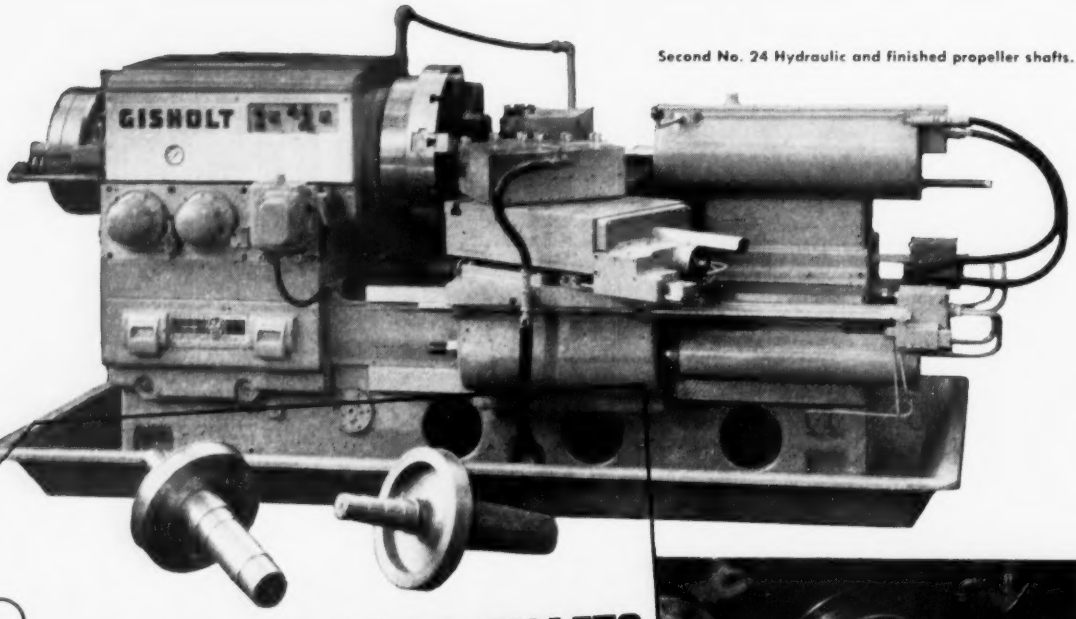
VPI also protects parts like these chopper blades at less cost. This fast, clean way to store or ship metal has been proven effective by the military and in the industries listed below. To get VPI facts that apply to your products, send the coupon now.

## Send for free VPI sample

Angier Corporation, Framingham 8, Mass.
Send sample & *VPI FACTS* as applied to

- ☐ Machinery-Industrial, Metal Working, Farm, Office, Construction
- ☐ Steel in process of fabrication
- ☐ Electrical Machinery, Appliances, Products
- ☐ Instruments and clocks
- ☐ Fabricated Products—Cutlery, Hardware, etc.
- ☐ Ordnance Equipment
- ☐ Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc.
- ☐ Others:

Name, Title (Sign and clip to letterhead)




Second No. 24 Hydraulic and finished propeller shafts.

# AIRPLANE PROPELLER SHAFTS AT BARGAIN PRICES!

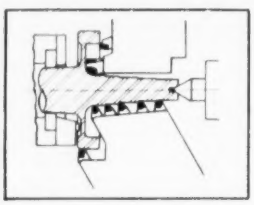
## from GISHOLT No. 24 AUTOMATIC LATHES

For speed and precision on these hefty drive gear and propeller shafts, production is divided between a pair of Gisholt No. 24 Hydraulic Automatic Lathes. The first machine gets the 275 lb. steel forging for nine different turning, chamfering, and facing operations on the 16″ gear blank and five-shaft diameters. 12 minutes later, the part moves to the second machine where nine tools perform similar work on the other side of the flange. Time again is 12 minutes.

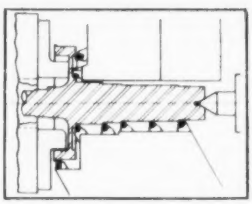
Together, the two No. 24 Hydraulics remove a total of 75 lbs. of material. One man operates both machines. Another tough job handled to perfection by these high production machines.

The Gisholt No. 24 Hydraulic, like the famed smaller No. 12 combines ease of setup with exceptional speed and accuracy—all with fully automatic operation that means low costs on any job. If you have work up to 24″ diameter, you should have full details on the rugged, powerful, No. 24 Automatic.

First No. 24 making chips on small end of shaft.



Tool arrangement for first operation.



Tool arrangement for second operation.

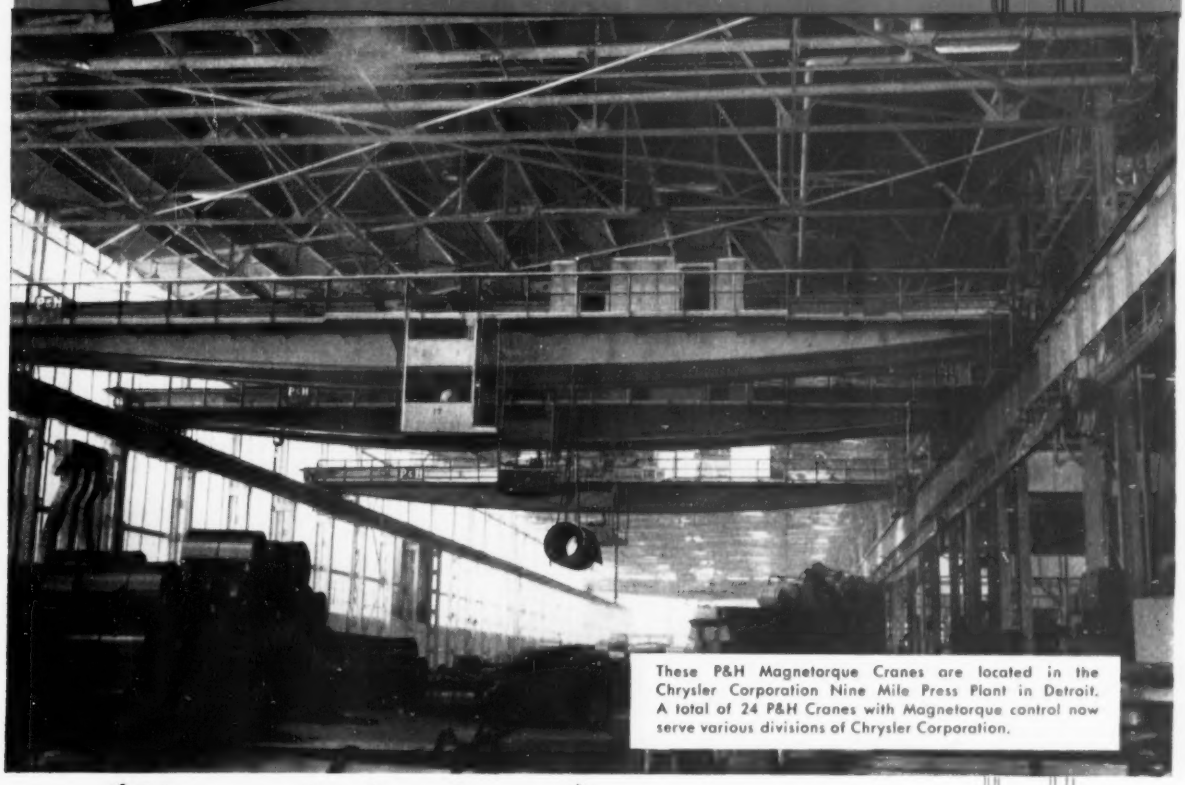
**THE GISHOLT ROUND TABLE**

*represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

**GISHOLT MACHINE COMPANY** Madison 10, Wisconsin

**TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES**

# P&H OVERHEAD CRANES



These P&H Magnetorque Cranes are located in the Chrysler Corporation Nine Mile Press Plant in Detroit. A total of 24 P&H Cranes with Magnetorque control now serve various divisions of Chrysler Corporation.

## "More of the Same" for Chrysler ...with P&H MAGNETORQUE® the job-approved AC Crane Control!

In six short years . . . over nine hundred installations in America's best-known plants! That's the remarkable success story of Magnetorque — the P&H development that revolutionized the crane industry.

You'll get superior performance . . . the finest known speed-load characteristics . . . with this time-proved and job-proved AC crane control. P&H Magnetorque has no mechanical load brake, nothing to wear, nothing to replace. Think what that means in freedom from maintenance worries and costs.

P&H electrical equipment — *all of it* — is designed and built exclusively for crane service, *not adapted for it!*

Consult with P&H about your crane plans for any plant expansion or modernization program.

P&H OVERHEAD CRANE DIVISION

**HARNISCHFEGER CORPORATION**

MILWAUKEE 46, WISCONSIN

NEW — picture — and fact-filled bulletin on industrial cranes mailed on request. Ask for Bulletin C6-3.

the P&H Line

# How a hot problem in steel stacks was solved with refractory concrete

**YOU'RE LOOKING UP** one of the twin 215′ steel stacks lined with refractory concrete at Basic Refractories, Inc.'s plant in Maple Grove, Ohio, for dead-burning granular refractories. Smooth, jointless construction and insulating properties provided excellent natural draft. Such refractory linings assure structural strength, plus high resistance to heat and corrosion.

REFRACTORY concrete linings in stacks, breechings and ducts provide protection against heat, corrosion and the abrasive action of high-velocity gases and fly ash. Made with suitable aggregate and Lumnite* calcium-aluminate cement, they withstand temperatures to 2600° F., and are highly resistant to thermal shock. Smooth, jointless construction allows excellent draft in stacks, breechings and ducts.

Stack linings are just one of the many ways special concretes made with Lumnite are serving industrial plants. They are readily poured, plastered or "shot" in place by cement gun. There are no small units to work loose; maintenance is lessened. When necessary, repairs can be made quickly, easily and economically. Refractory concrete made with Lumnite Cement reaches service strength within 24 hours.

• • •

**FOR CONVENIENCE,** many prefer to make refractory concrete with prepared castables. (Lumnite Cement plus suitable aggregates selected for specific temperature and insulation service—add only water.) They're made by refractory manufacturers and sold through their dealers. For more information, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**SPECIFIED TO MEET TOUGH DESIGN** requirements, these stacks for large rotary kilns needed linings that could withstand 1400 to 1700° F. operating temperatures. Designers used an 8"-thick refractory concrete lining . . . poured in place.

*"LUMNITE" is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.

S-L-85

**ATLAS®** **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

A UNIVERSAL ATLAS PRODUCT

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.

# extra clamping surface here for the bulky casting!

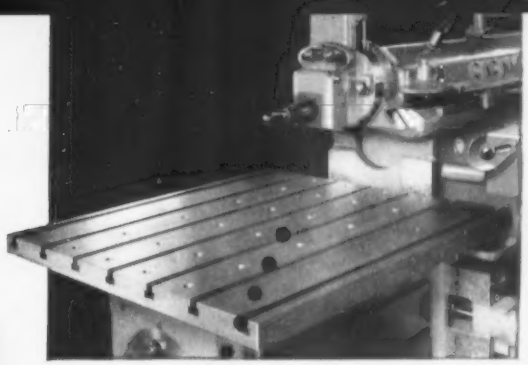
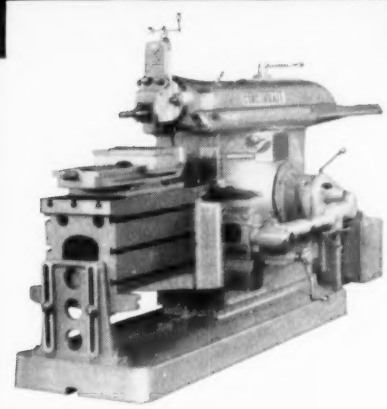


*Photo courtesy of Marion Machine Foundry & Supply Company.*



Cincinnati Shapers with large area Cincinnati Supplementary Table Tops allow firm clamping of heavy bulky castings. These tables are a profitable accessory.

Set-up time is reduced, and more accurate cutting results from the firm clamping. It widens the use of a Cincinnati Shaper and is easily attached.

The versatility of a Cincinnati Shaper, "The handy man of industry", makes it a busy profitable tool in the shop.

Write for complete Catalog N-6.

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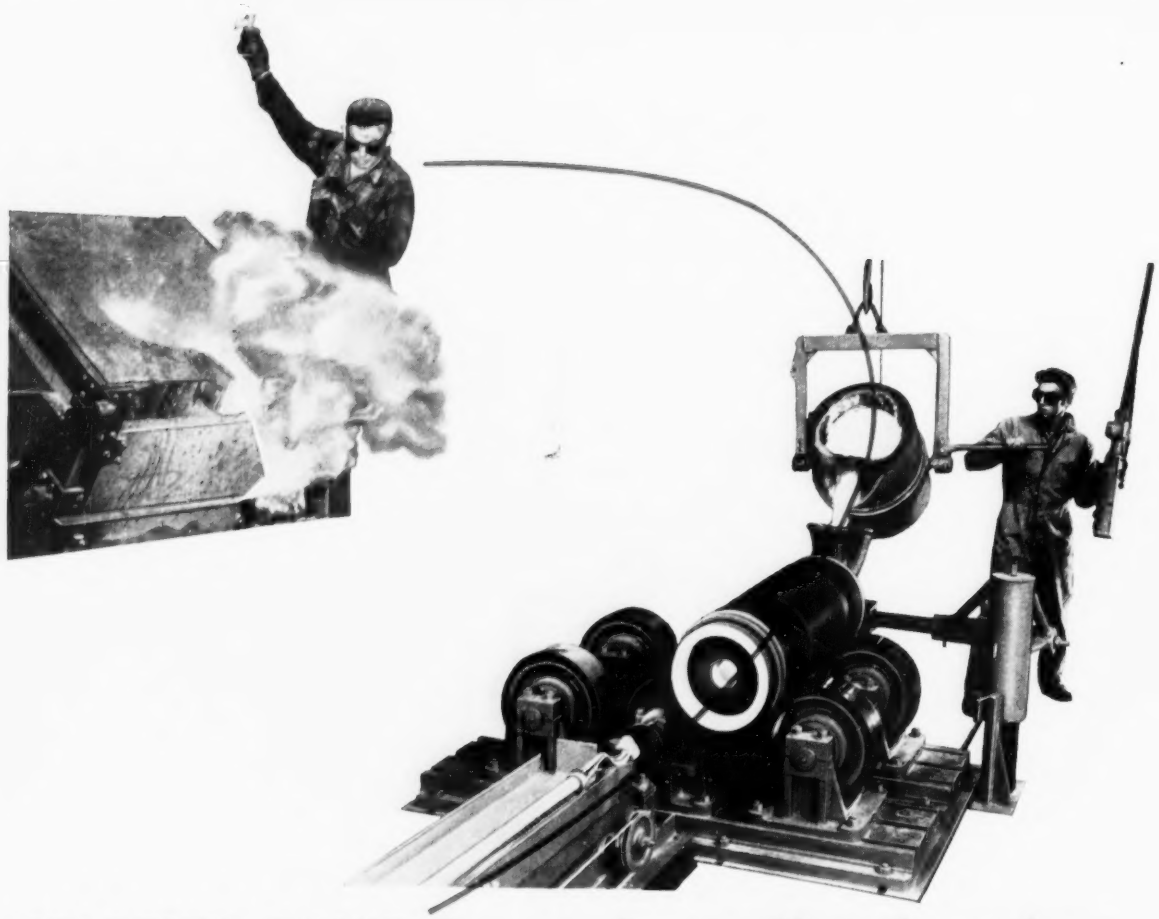


# STARTING POINT for good centrifugal castings

All good casting starts in the melt with more accurate control of temperature and closer control of chemical composition. These are both *inherent advantages* of Ajax-Northrup High Frequency, Hi-Speed Induction Furnaces.

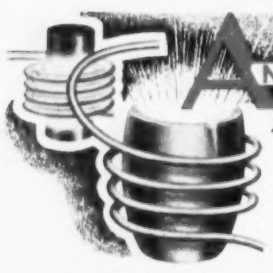
Accurate analysis is simply achieved and continuously maintained by fast melting . . . with practically no chance for oxidation. Alloying is easy because losses are negligible . . . you get out what you put in. And, even with elements of widely dissimilar densities, you pour metal of uniform composition since the melt is constantly, thoroughly stirred by electromagnetic action inherent to the furnace principle.

In actual production with an Ajax-Northrup Furnace, alloying elements can be controlled usually within 0.25%; carbon within 0.01 or 0.02%. Melts can be reproduced . . . each time with identical composition . . . or alloys may be varied quickly. Pouring temperature, especially important in centrifugal and precision casting, may be maintained exactly as desired.

Practical savings with Ajax-Northrup Hi-Speed Melting are found in the almost complete recovery of alloying elements. Savings are also realized in an overall reduction in rejects and subsequent grinding operations.

*TECHNICAL DATA AVAILABLE:* Tell us what you're melting . . . and in what quantities. We'll send you the proper bulletins.

543



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AJAX ELECTROTHERMIC CORPORATION • AJAX PARK, TRENTON 5, NEW JERSEY

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# CALENDAR
## OF MEETINGS

**April 5-6, Society of the Plastics Industry (Canada) Inc.:** Annual conference, Mt. Royal hotel, Montreal, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

**April 5-7, American Institute of Mining & Metallurgical Engineers:** National open hearth conference, Palmer House, Chicago. Institute address: 29 W. 39th St., New York. Secretary: E. H. Robie.

**April 5-7, American Society of Lubrication Engineers:** Annual meeting and exhibit, Hotel Netherland Plaza, Cincinnati. Society address: 84 E. Randolph St., Chicago 1. Secretary: W. P. Youngclaus Jr.

**April 5-7, Metal Treating Institute:** Spring meeting, The Homestead, Hot Springs, Va. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

**April 5-7, National Fluid Power Association:** Spring meeting, Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

**April 5-8, American Management Association:** National packaging exposition and conference, Convention Hall and Auditorium, Atlantic City, N. J. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

**April 6-7, Machine Tool Electrification Forum:** Westinghouse Electric Corp., sponsor; Hotel Statler and Westinghouse works, Buffalo. Information: A. G. Muller, Westinghouse, East Pittsburgh plant.

**April 6-9, American Leather Belting Association:** Spring meeting, The Homestead, Hot Springs, Va. Association address: 320 Broadway, New York 7. Executive vice president: E. R. Rath.

**April 7-9, International Acetylene Association:** Spring meeting, Palmer House, Chicago. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

**April 11-13, American Trucking Associations Inc.:** Annual conference, Palmer House, Chicago. Association address: 1424 16th St., NW., Washington 6. Managing director: John V. Lawrence.

**April 11-15, American Hardware Manufacturers Association:** Spring meeting, Roosevelt hotel, New Orleans. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

**April 12, Society of Automotive Engineers:** Annual aeronautic production forum, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary and general manager: John A. C. Warner.

**April 12-14, American Gas Association:** Sales conference on industrial and commercial gas, Edgewater Beach hotel, Chicago, Ill. Association address: 420 Lexington Ave., New York 17. Secretary: Kurwin R. Boyes.

**April 13, Material Handling Institute Inc.:** Spring meeting, Drake hotel, Chicago. Institute address: 813 Clark Bldg., Pittsburgh 22. Secretary: N. F. Young.

**April 13-14, American Institute of Steel Construction:** Annual national engineering conference, Hotel Schroeder, Milwaukee, Wis. Institute address: 101 Park Ave., New York 17, N. Y. Secretary: M. Harvey Smedley.

**April 13-14, Industrial Truck Association:** Spring meeting, Drake hotel, Chicago. Association address: Washington Loan & Trust Bldg., Washington 4. Secretary: William Van C. Brandt.

**April 20, Conference on Instrumentation in Water, Sewage and Industrial Waste Treatment:** Manhattan College, New York 71. Information: Civil Engineering Dept., Manhattan College, New York 71.

**April 21-23, American Institute of Electrical Engineers:** Annual conference on feedback control systems, Hotel Claridge, Atlantic City, N. J. Information: G. L. Standiff Jr., Vickers Inc., 723—15th St., NW., Washington, D. C.

**April 21-23, National Screw Machine Products Association:** Annual meeting, Hotel Statler, Detroit. Association address: 2860 E. 130th St., Cleveland 20. Executive secretary: Orrin B. Werntz.


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**ANY SIZE OR TYPE, IT WILL PAY YOU TO CHECK FIRST WITH**

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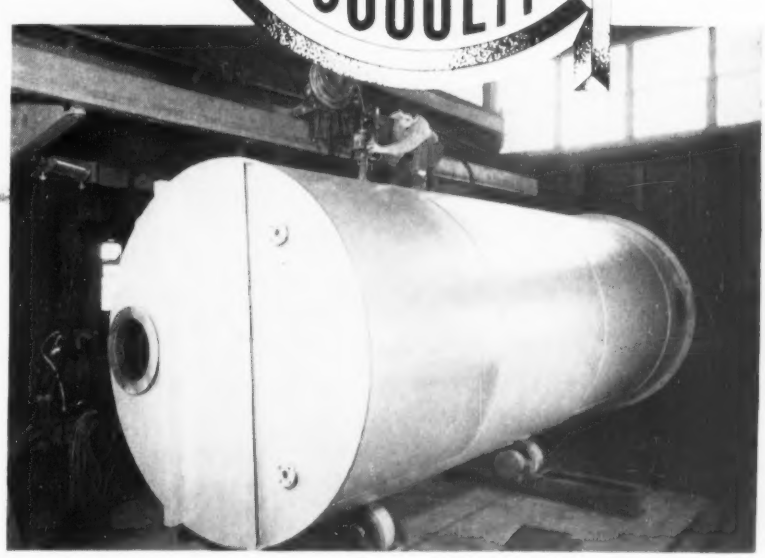

Gussett has been fabricating tanks, pressure vessels and special processing equipment for more than forty years . . . has both the "know how" and complete, modern facilities to meet all your requirements of quality and delivery.

Gussett fabricates custom built tanks and pressure vessels of carbon, alloy or stainless steel, clad steel or non-ferrous metals . . . plain, lined, jacketed or A.S.M.E. Code . . . to your specifications. When you need Tanks or Pressure Vessels for any purpose—special processing equipment or any other type of plate fabrication—check first with Gussett. A phone call—Canton 7-3413—will bring a representative.

*TO HELP YOU PLAN YOUR JOBS,*

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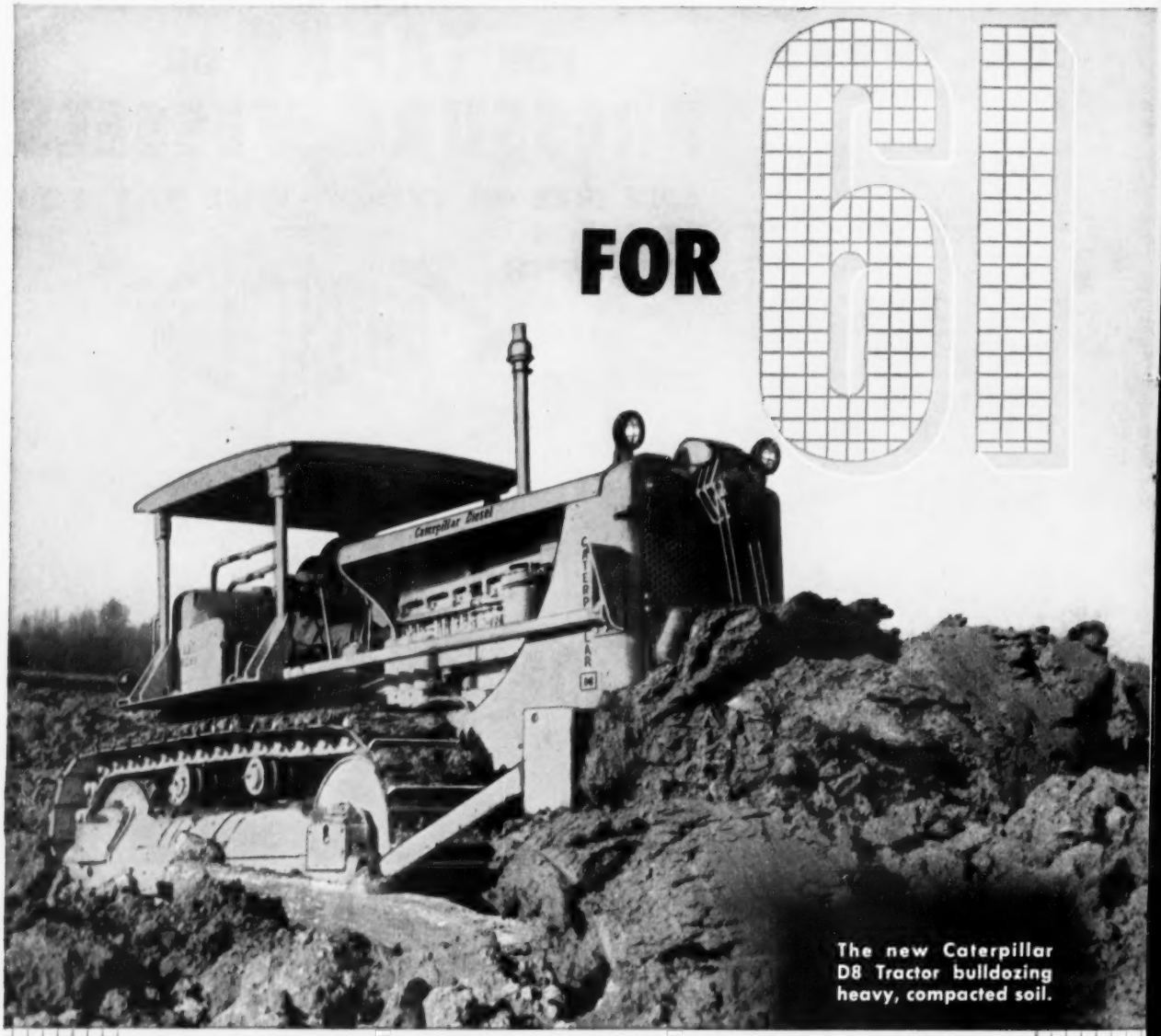
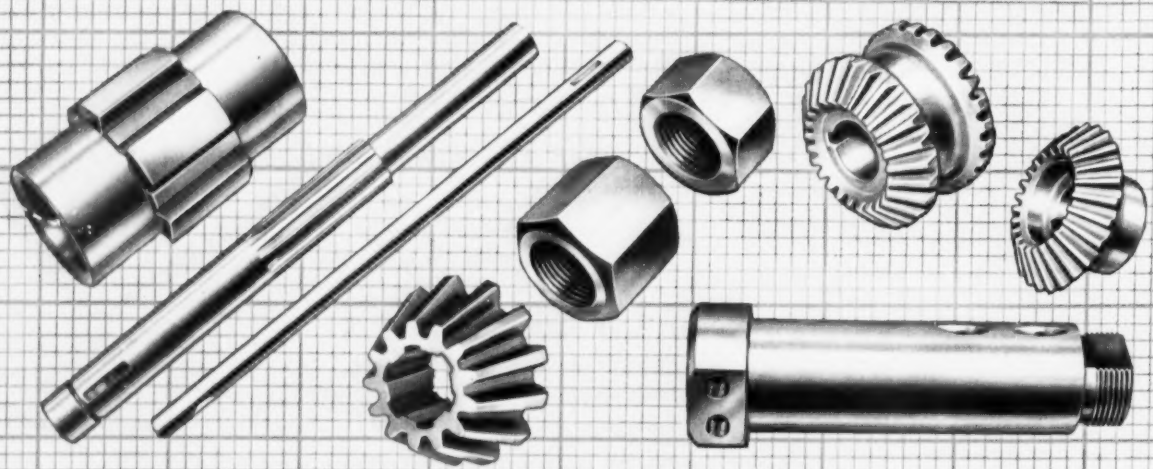
# FOR 61




The new Caterpillar D8 Tractor bulldozing heavy, compacted soil.

## EXAMPLES OF STRESSPROOF ON CATERPILLAR-built MACHINES



# IMPORTANT

# PARTS

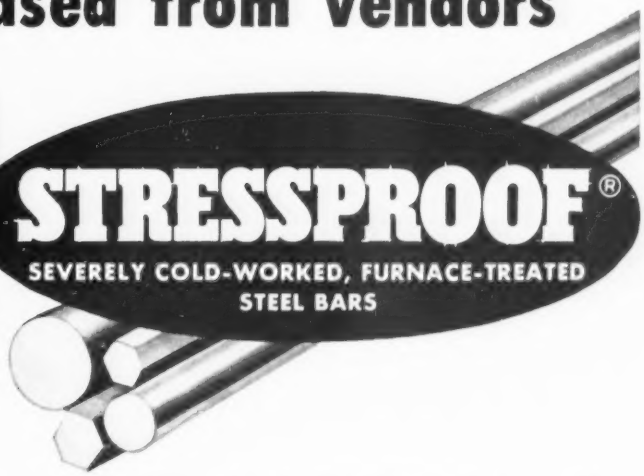
**plus many more purchased from vendors**

# Caterpillar®

**Tractor Co. uses**

## STRESSPROOF®

**SEVERELY COLD-WORKED, FURNACE-TREATED STEEL BARS**



Caterpillar never compromises quality. A Caterpillar-built machine is known the world over for its strength, ruggedness, and built-in stamina . . . it just doesn't quit.

And Caterpillar uses STRESSPROOF for 61 important parts. STRESSPROOF has the strength Caterpillar wants, the quality they demand, and gives them these qualities as machined . . . without conventional heat treating for these applications.

No heat-treatment of STRESSPROOF is required by Caterpillar—no distortion and cleanup after heat treating—no looking for quench cracks.

In addition, LaSalle STRESSPROOF also provides machinability and finish approaching that of screw stock, affording opportunities for cost reduction.

STRESSPROOF must meet Caterpillar's quality specifications—specifications that give Caterpillar a better part for these applications. Why don't you try this steel on your quality applications? Call or write, today.

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Top camera-makers in this country use Bristol Brass in their flash reflectors . . . because Bristol Brass draws evenly . . . just a true, unblemished surface that takes a smooth, even plate and focuses the most light where it will do the most good.

This is a businesslike example of one of the many good reasons why so many fabricators of so many different types of products won't settle for anything but *Bristol* Brass strip, coil, rod and wire. See what Bristol's Sales Engineering Service can do to help with *your* fabricating problems. And this service is no farther away than your telephone: Bristol 9246 — or wire or write:

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*has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21.*

"Bristol-Fashion" means **Brass at its Best**

a "standardized" line

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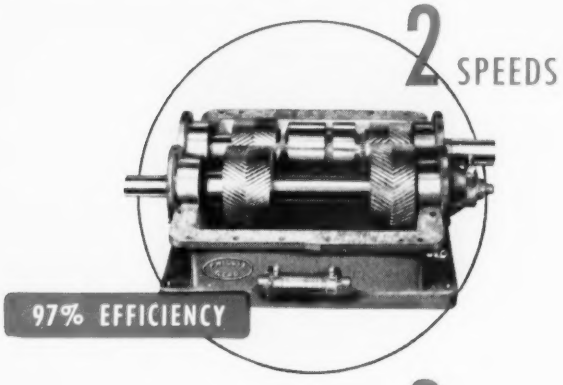


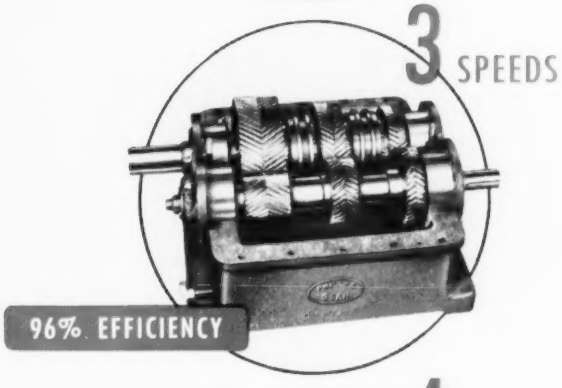


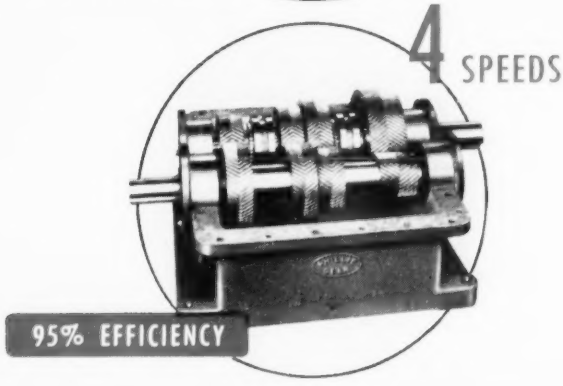


Yes, "another first" with *Phillie Gear*, these *standardized*, self-contained, compact *all-gear type speed changers*. They are available in 2, 3 or 4 speed changes, providing definite ratios of speed reduction, speed increasing (or a combination of both). Speed changes are accomplished by just the "mere turn of a control lever".

These exclusive units were designed to fill Industry's need for a highly efficient, precision-built *standardized line* . . . to eliminate the high cost and delayed deliveries of specially designed units.

Gear specifications: All gears and pinions are Sykes Continuous Tooth Herringbone type, precision cut of involute shape, carefully heat treated and finished, and designed for maximum tooth contact and overlap.

All component parts and materials in these unusual Units are of highest quality and workmanship: Housings, Shafts, Bearings, Clutches, Lubrication Systems, etc.

Ratings are according to AGMA recommendations for continuous service, with allowance for 100% overload in starting and for momentary shock loads . . . shafts and bearings are of proper size to permit heavy overhung loads resulting from use of sprockets or pulleys.

*Be convinced*, write for 24 page illustrated catalog #CSU-52.

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*Industrial Gears and Speed Reducers*
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Your particular requirements for formability, uniformity, and drawing qualities determine every step in the production of your order of J&L Sheet and Strip.

An understanding of product end use, and the physical and chemical properties required to do the job, are the foundation for J&L quality control practices. And J&L quality control assures accurate adherence to your specifications.

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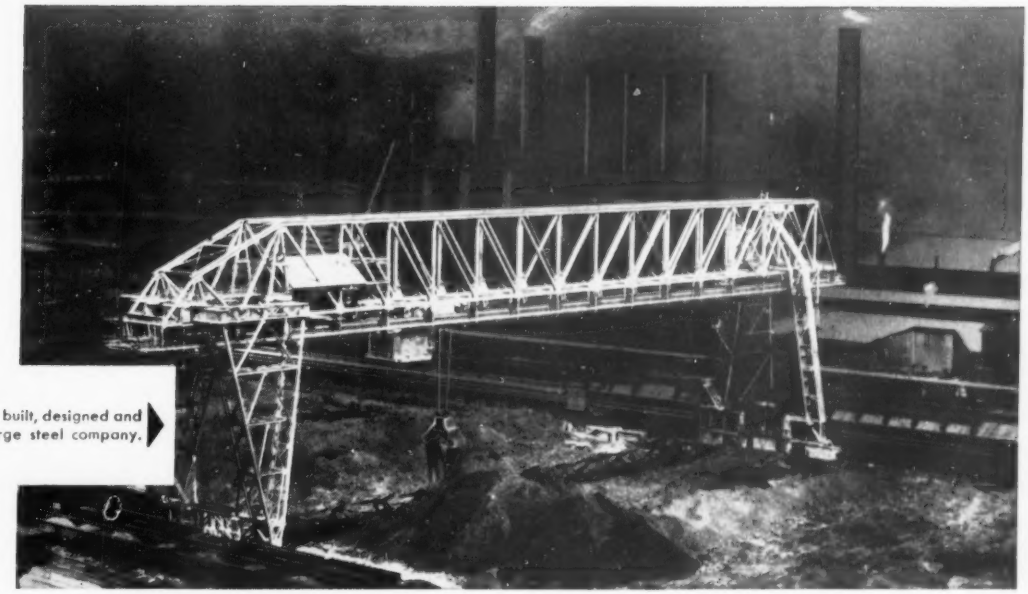

12-ton ore bridge, built, designed and installed for a large steel company.

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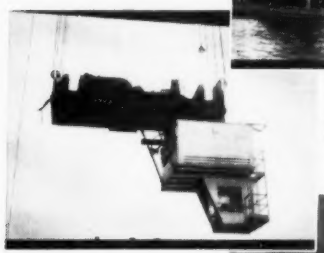
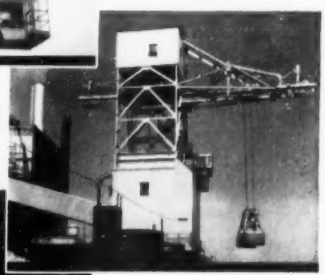
Travelling unloading towers built to handle imported iron ore at an Atlantic port.

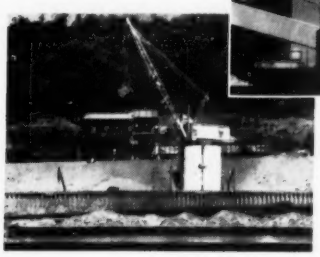
Whirler crane mounted on pontoon hull is used for dredging and general contract work.



Light-weight man trolley installation increased bridge handling capacity 60%.



Coal unloader designed and built for a large mid-western electric power company.



Stationary whirler crane designed and built to transfer coal from barges to hopper cars.

Over-all economical and safe performance is best obtained by using materials-handling equipment designed to suit your operating conditions. If you're planning a new materials-handling installation, we suggest an early "Round Table" session with Dravo engineers.

From actual experience over the past 60 years in building and installing the equipment shown here, valuable data is available in working out the features you want in your installation. This information, along with your own operating experience, can be used to create a design incorporating all the best features for easy maintenance, a high safety factor and simple, economical and satisfactory operation.

You can profit by taking advantage of this specialized "Round Table" service.

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Walsh takes justifiable pride in the fact that a variety of its products have been installed in the plants of leading steel manufacturers. Walsh Missouri-Quality Refractories have helped to bring efficiency and economy to steel companies throughout the country. Each time-tested brand of Walsh fire brick or other refractory material is an investment in greater production . . . lower cost . . . the result of careful selection of raw materials, advanced methods of manufacture and better research and ceramic engineering. We are anxious to demonstrate the dependability of Walsh Refractories in your operation. Your inquiries are welcome and will have our prompt attention.

**MULLITEX H B, High Burn Special Super Duty Fire Brick . . . APEX—Extra Duty Stiff Mud Deaired Fire Brick • Walsh Insulating and Refractory Castables • High Temperature Cements • Plastic Fire Brick • Other Special Ramming Mixes**

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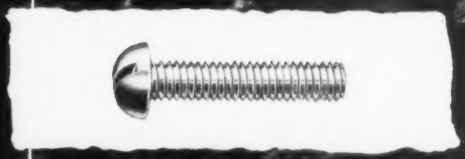
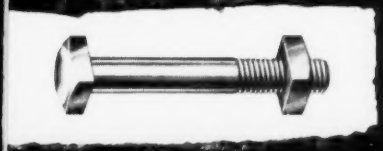
**For over 50 years manufacturers of high grade refractories**



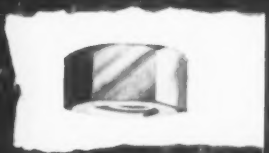
building

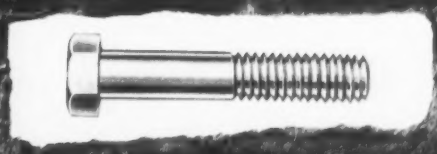
a **solid** reputation



over

35 years





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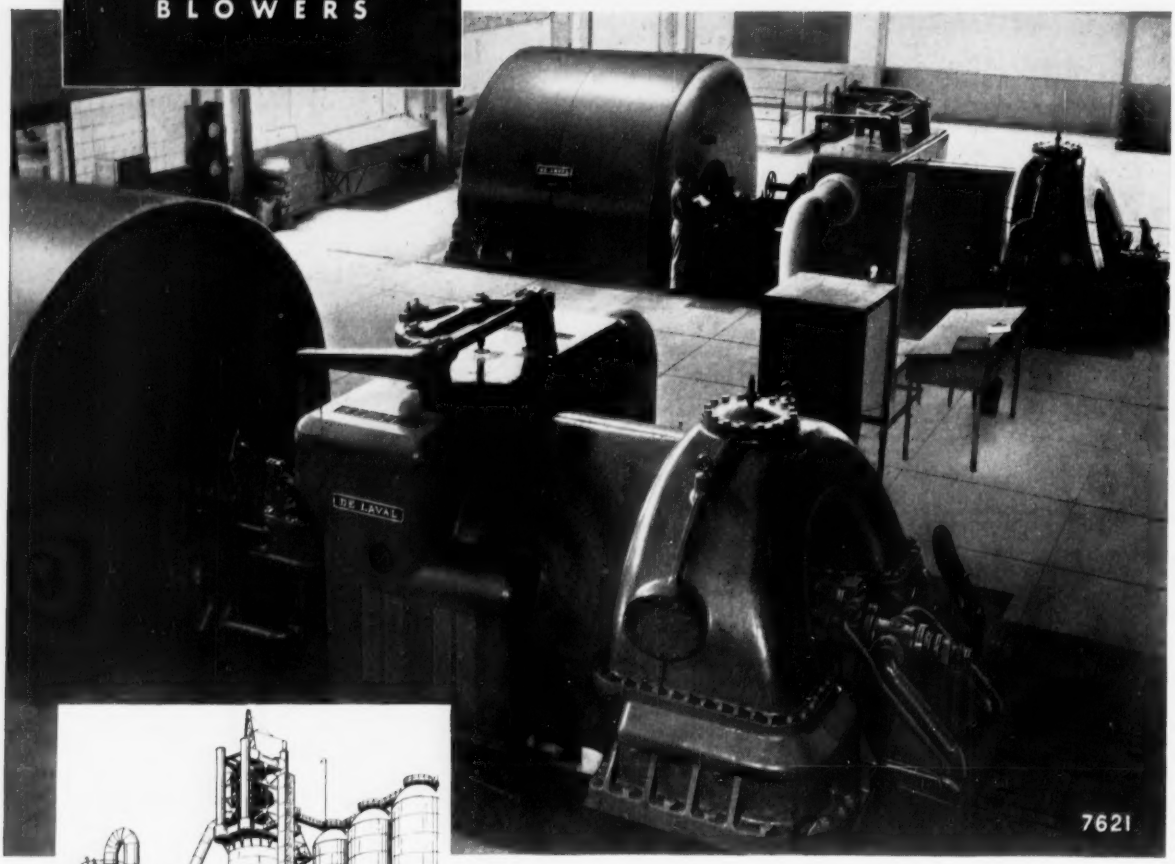
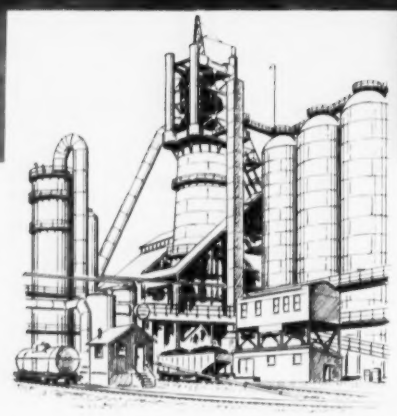
## *designed for giant furnaces*



**These twin De Laval blowers,** on the job in a leading mid-western steel mill, are among the largest ever built. Each is a five-stage unit with a rated capacity to deliver 121,000 cfm of air at 35 psig discharge pressure. Each is driven by a 15,220 hp, 2,500 rpm De Laval 16-stage steam turbine operating under steam conditions of 400 psig, 750 F with 28 in. vac.

The total weight of each De Laval turbine and blower is over 167 tons; the blower alone is over 212,000 lbs. Shafts of the turbine and blower were made large and heavy to meet the wide range of varying speed conditions required in blast furnace service. Outside diameter of the blower casing is 12 ft. and it is divided horizontally in the plane of the shaft. This permits raising the upper half of the casing for easy access to all interior parts. • For a quarter of a century, De Laval has pioneered in advanced blower engineering designs and practices. De Laval builds single and multi-stage centrifugal blowers and compressors for service in steel, gas and coke plants. Discuss your specific applications with a De Laval Sales Engineer.

**DE LAVAL** *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY
*860 Nottingham Way, Trenton 2, New Jersey*

DL 234

# It's outstanding!

EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing . . . that this spring steel is absolutely unexcelled for dimensional and mechanical uniformity . . . for speeding production and cutting down rejects.

You always *pay* for the best when you buy flat spring steel . . . make sure you *get* it by specifying Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

**ROEBLING** CF&I

*A subsidiary of The Colorado Fuel and Iron Corporation*



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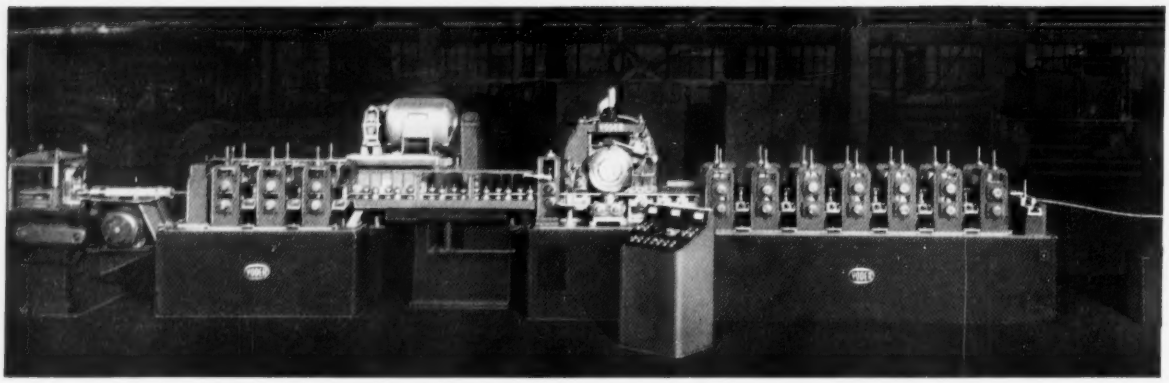
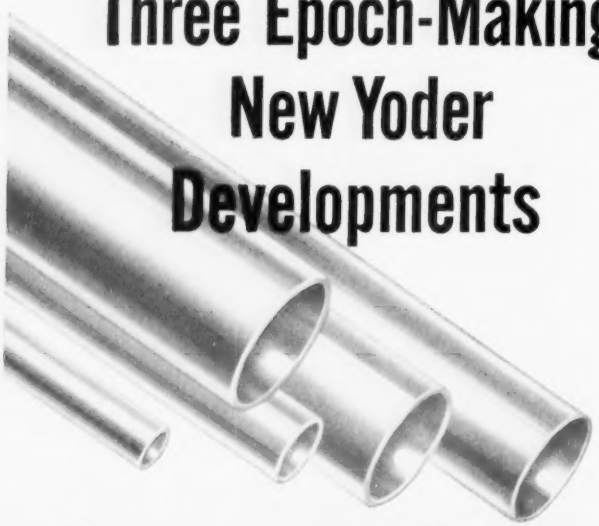


# Three Epoch-Making New Yoder Developments



## step up scope and economy of *Electric-weld* Tube Manufacture

**1.** For high-speed, low-cost production of tubing from aluminum, nickel, brass and other non-ferrous metals and alloys: Revolutionary new high-frequency electric induction mills for cold-forming and welding coiled strip into tubing, *without drawing* or *heat treating*. Welding speeds from 30 to 120 fpm.—almost as fast as electric-weld steel tube making. *The lighter the gauge, the higher the speed and lower the cost, all the way down to .025".*

**2.** New Induction-Weld Mill for making STEEL tubing up to 4" dia. and merchant pipe up to 2" dia. Speeds up to 250 fpm.—almost double that of resistance welding.

**3.** New 4-in-1 Resistance Welding Transformer—actually four small transformers built into the most compact, efficient, trouble-free unit ever designed for tube welding. Insures highest daily production of quality tubes, with minimum scrap loss.

All three developments are Yoder "Firsts"—making cold process tube manufacture more attractive than ever. For detailed information and literature, write, phone, or wire

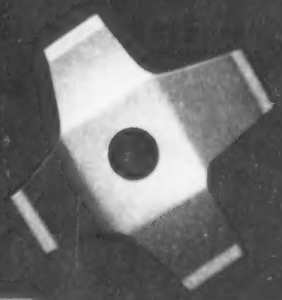
**THE YODER COMPANY** • 5502 Walworth Ave. • Cleveland, Ohio

*Complete Production Lines*

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

*You don't have to look far...*



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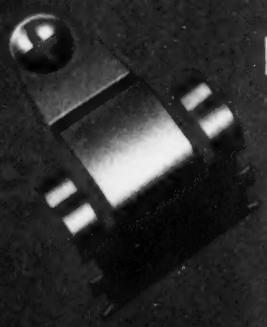
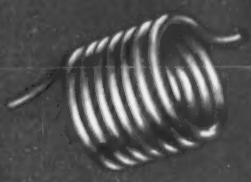


*for*

# GOOD SPRINGS



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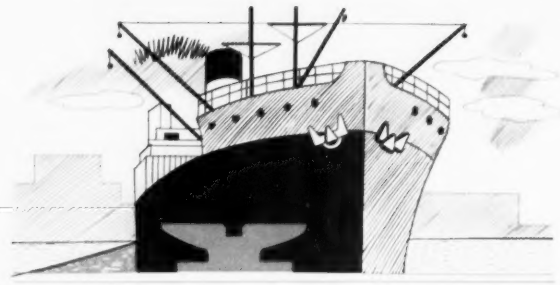
IN CANADA - The WALLACE BARNES CO., Ltd., Hamilton, Ontario

# you can't show a profit while the cargo's in the boat



**Brownhoist equipment speeds material handling in ports all over the world**

There's no profit in a shipment of bulk cargo until you get it out of the boat and put it to work for you. The quicker and cheaper you can do this, the bigger your profit will be. BROWNHOIST builds a variety of special equipment for handling bulk materials in large quantities rapidly and efficiently. The 15 gross ton boat unloader you see here, for example, can unload 1200 tons of ore an hour. It has a reach of 70 feet from the face of the dock on either side. The unloader is equipped with adjustable voltage control which gives extremely smooth operation and maximum production. BROWNHOIST also builds traveling bridge cranes, fast plants, storage bridges, car dumpers, locomotive cranes and clamshell buckets. Each machine is specifically engineered to do the job it is designed for as quickly and as economically as possible. For information about BROWNHOIST equipment to meet your requirements, consult your nearest BROWNHOIST representative or write us today.

## BROWNHOIST

builds better cranes

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CLAMSHELL BUCKET

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**INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN** • DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Montreal, Q. • AGENCIES: Detroit, Birmingham, Houston, Los Angeles

# *Contractor* calls for YOUNGSTOWN PIPE

SEND ME SOME MORE PIPE, PAUL. THAT LAST LOAD OF YOUNGSTOWN PIPE SAVED ME A LOT OF TIME. IT SURE WAS EASY TO CUT.
GLAD TO HEAR IT, PETE. THAT'S WHAT ALL MY CUSTOMERS SAY. THEY LIKE YOUNGSTOWN PIPE BECAUSE IT'S CONTROLLED IN MANUFACTURE BY ONE STEELMAKER FROM START TO FINISH. AND EVERYBODY KNOWS TOP NOTCH STEEL IS EASIER TO WORK WITH.
QUALITY
YOUNGSTOWN
SERVICE

7 points of uniform goodness
in YOUNGSTOWN PIPE

- uniform ductility
- uniform lengths
- uniform threading
- uniform weldability
- uniform wall thickness and size
- uniform strength and toughness
- uniform roundness and straightness

# Youngstown STEEL PIPE

**THE YOUNGSTOWN SHEET AND TUBE COMPANY** *Manufacturers of Carbon, Alloy and Yoloy Steel*

**General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.**

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

# Is that

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## Today STEEL helps you do two jobs that provide the answer to that question

Seventeen dollars is the price industry pays today for the average sales call. When you're buying calls at this price, you've got two problems:

1. To guide your salesmen to the kind of prospect who represents potential volume sufficient to make \$17.00 sales calls pay off.
2. To boost your salesmen's productivity by *preconditioning* the market in advance of salesmen's calls.

To help you solve both, STEEL continues to gear its publishing and circulation programs to the needs of the world's largest industrial market.

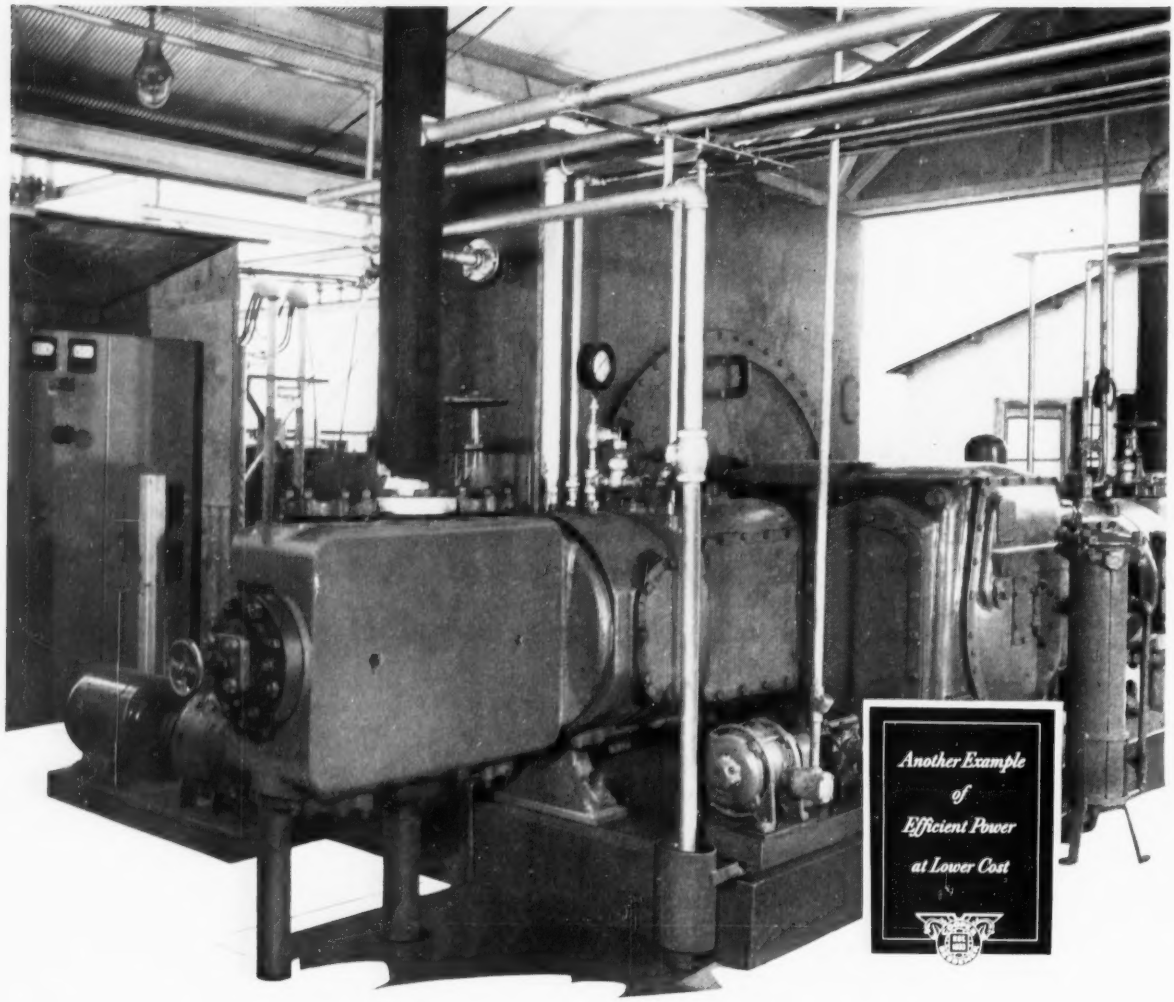
That's why, through the pages of STEEL, you reach more U. S. metalworking plants with the most industrial buying power.

Moreover, you back your salesmen's efforts by talking to the "influential four" in metalworking . . . the key management, production, engineering and purchasing executives who say "Yes" or "No" to the order.

Isn't *this* the kind of help you want and need today to put action *into* and pull returns *out of* those \$17.00 sales calls?

Talk to the man from STEEL. He has market facts and figures, and other sales direction aids you'll be interested in. STEEL, Penton Building, Cleveland 13, Ohio.

PUT THE STRENGTH OF STEEL
INTO YOUR ADVERTISING PROGRAM




# Cooper-Bessemer Compressors operate "on their own"

ACTUALLY, the statement that Cooper-Bessemers are "on their own" is far from an exaggeration. For example, this single stage Cooper-Bessemer FM-2 compressor, installed in a Michigan refinery, runs 24 hours a day without operating personnel.

This money-saving advantage is made possible by highly efficient Cooper-Bessemer controls which automatically handle all phases of the compressing operation.

Moreover, in this plant's processing, contamination by oil is completely avoided. Therefore, the FM unit is equipped with Cooper-Bessemer *carbon pistons*, operating against micro-honed mirror finish liners, requiring no lubricating oil whatever! — a highly important factor in various processes involving compressed air and other gases.

Whatever your compressor requirements may be, from 100 to 5000 hp, Cooper-Bessemer offers you unique advances assuring the highest efficiencies combined with lowest cost operation. Your nearest Cooper-Bessemer office will gladly give you the specific information you may require.

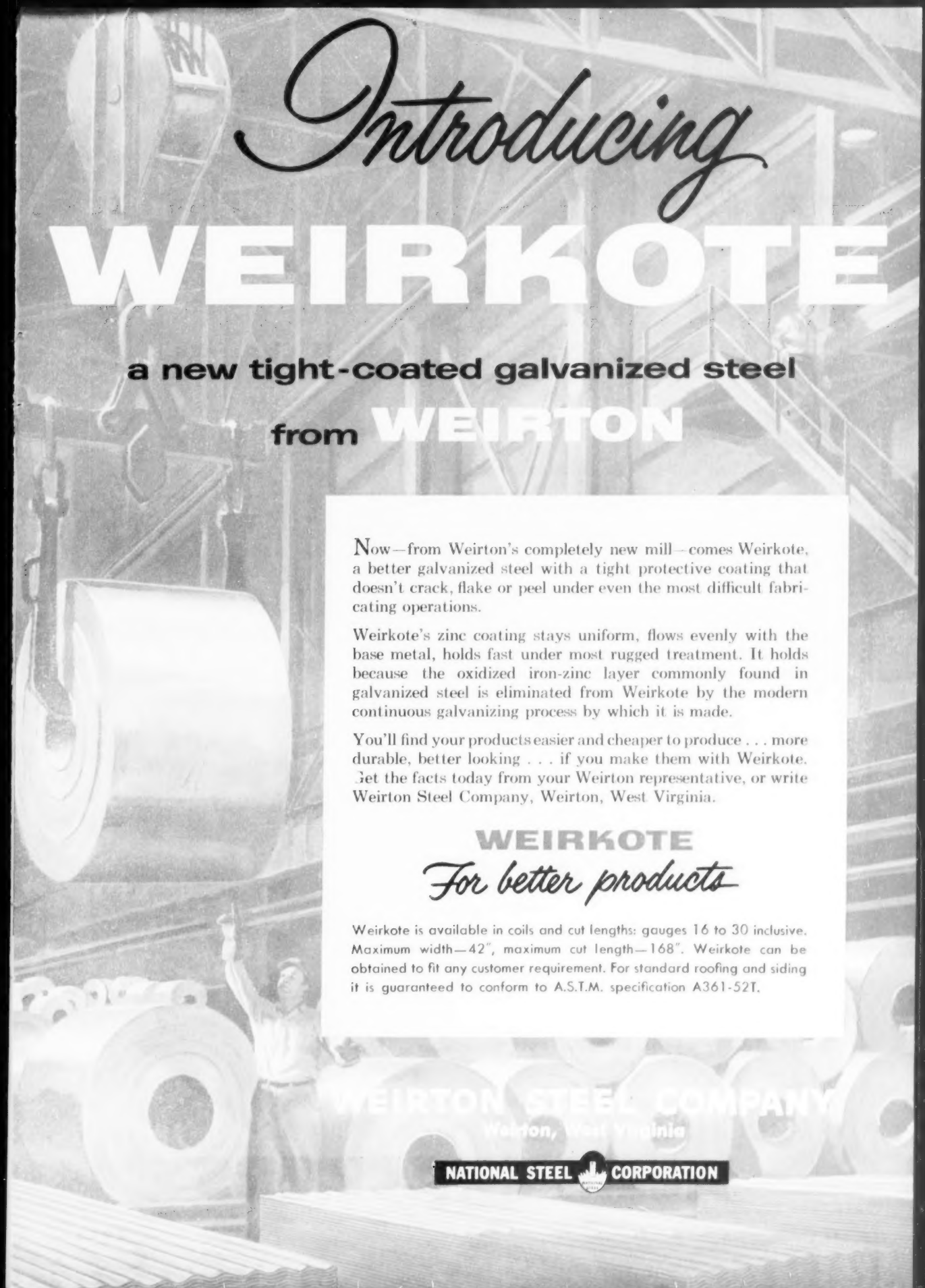
MOUNT VERNON, OHIO

**COOPER-BESSEMER**

GROVE CITY, PENNA.

New York City • Seattle, Wash. • Bradford, Pa. • Chicago, Ill. Houston, Dallas, Greggton, Pampa and Odessa, Texas Washington, D. C. • Shreveport, La. • San Francisco, Los Angeles, Calif. • St. Louis, Mo. • Gloucester, Mass. • New Orleans, La. • Tulsa, Okla. • Cooper-Bessemer of Canada Ltd., Edmonton, Alberta—Halifax, Nova Scotia.

**DIESELS • GAS ENGINES • GAS-DIESELS • ENGINE-DRIVEN AND MOTOR-DRIVEN COMPRESSORS**



# *Introducing*

# WEIRKOTE

## a new tight-coated galvanized steel

## from WEIRTON

Now—from Weirton's completely new mill—comes Weirkote, a better galvanized steel with a tight protective coating that doesn't crack, flake or peel under even the most difficult fabricating operations.

Weirkote's zinc coating stays uniform, flows evenly with the base metal, holds fast under most rugged treatment. It holds because the oxidized iron-zinc layer commonly found in galvanized steel is eliminated from Weirkote by the modern continuous galvanizing process by which it is made.

You'll find your products easier and cheaper to produce . . . more durable, better looking . . . if you make them with Weirkote. Get the facts today from your Weirton representative, or write Weirton Steel Company, Weirton, West Virginia.

**WEIRKOTE**

*For better products*

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION

# *Built for* SEVERE DUTY

## frequent starting · inching · reversing · dynamic braking

**ALLIS-CHALMERS**

*Durability and long-term dependability* were given prime consideration in the design of the Allis-Chalmers Type 256 air-break contactor. As a result, the roughest repetitive duty becomes routine — contact operations are actually numbered in the millions with a minimum of servicing.

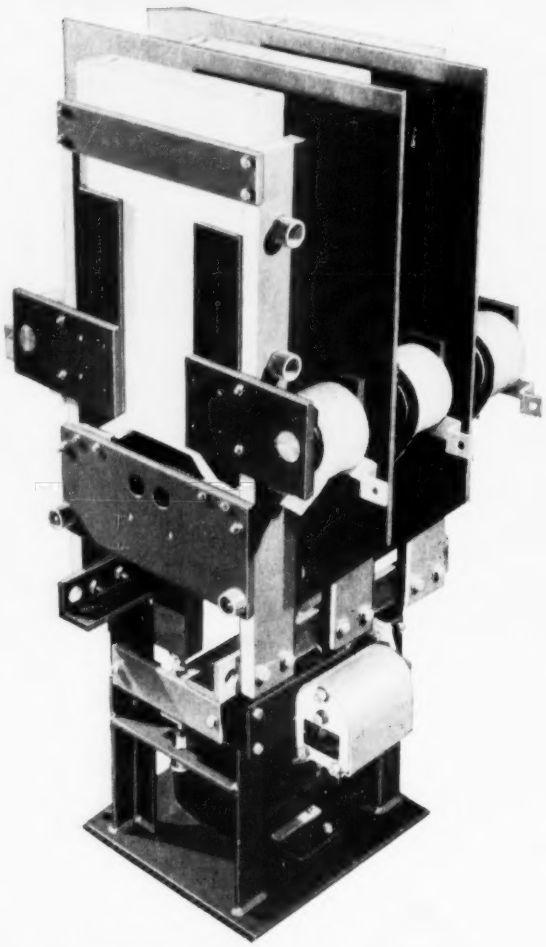
### DESIGN FEATURES

By utilizing a simple vertical motion and double break contacts, troublesome maintenance factors, such as mechanical linkages, turning shafts, shaft bearings and flexible leads, have been eliminated. From the operation standpoint, two gaps in series cut arc voltage in half. Rapid arc extinction is further facilitated by magnetic blowouts at each gap, operating with arc chutes designed to take full advantage of dual blowouts.

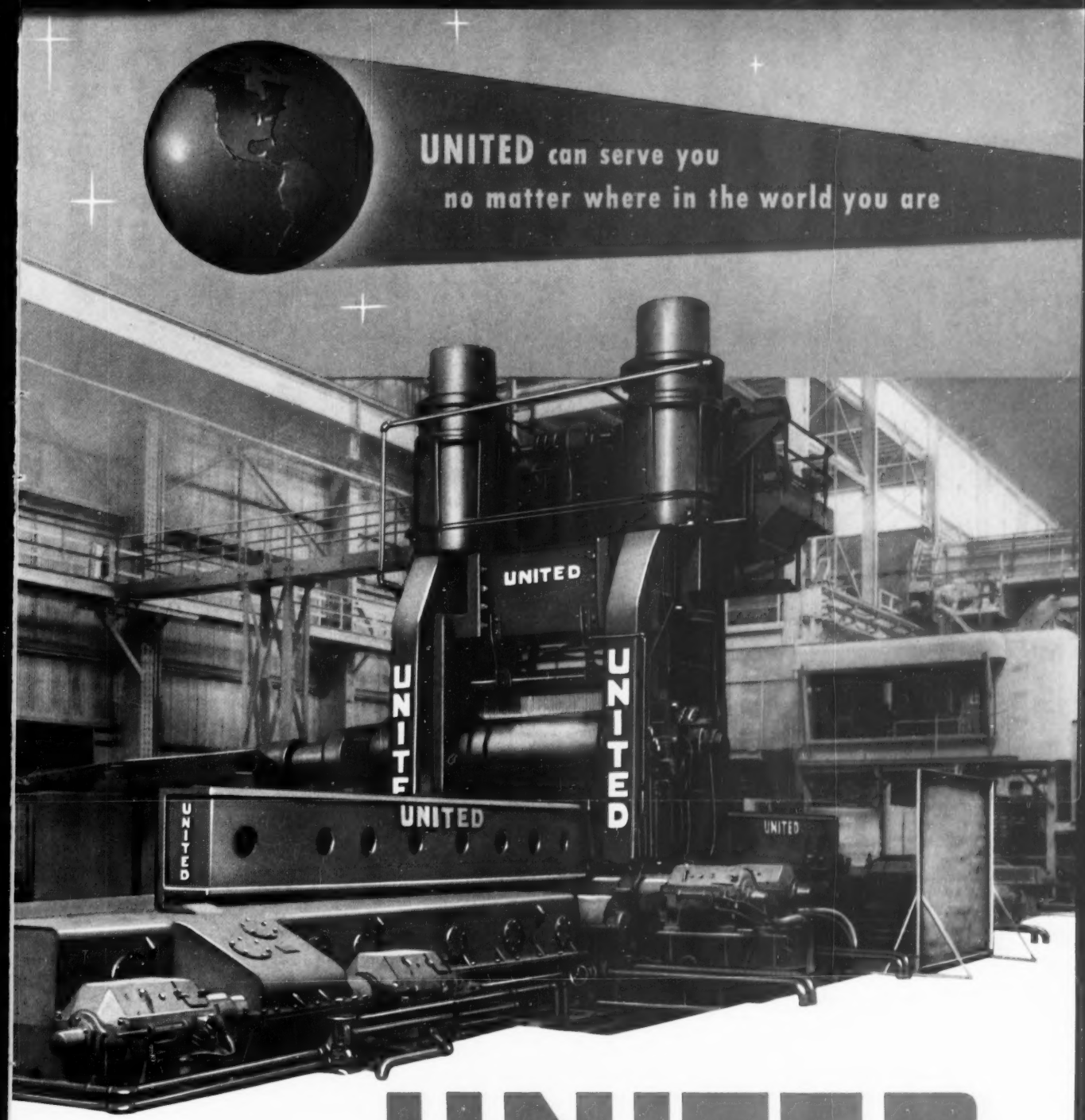
**In Allis-Chalmers Type H high voltage starters,** Type 256 air-break contactors — along with meters, overload relays, current limiting fuses, auxiliary switches — are coordinated to meet heavy duty demands — to provide high capacity interruption and complete protection for man, motor and machine. For complete information see your nearby A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for bulletins 14B6410B and 14B7303.

A 4325

FOR 2300 TO 5000-VOLT MOTOR CONTROL



# ALLIS-CHALMERS




# UNITED®

## *Slabbing Mill*

**UNITED ENGINEERING AND FOUNDRY COMPANY**

PITTSBURGH, PENNSYLVANIA

*Plants at* Pittsburgh • Vandergrift • New Castle • Youngstown • Canton

Subsidiaries: Adamson United Company, Akron, Ohio
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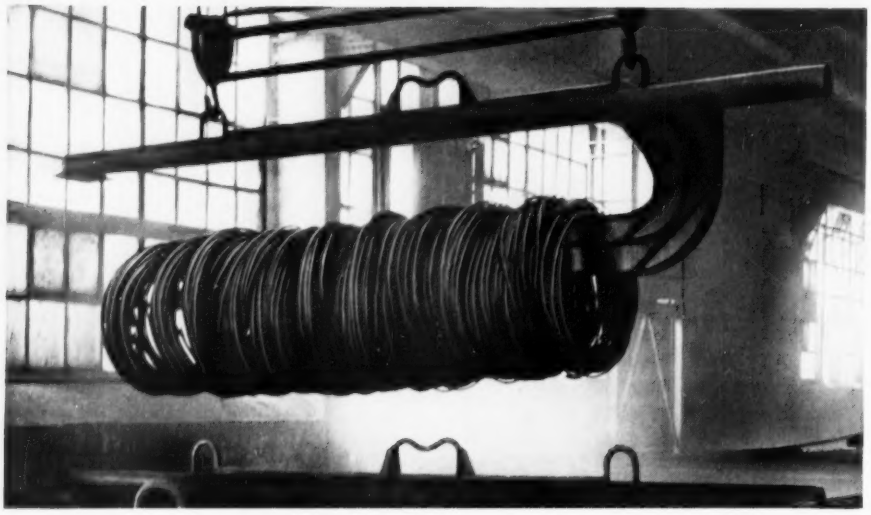
Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.



18-foot Monel pickling hooks like this at Pittsburgh Screw And Bolt Corporation carry payloads of 6000 pounds to increase production and cut costs.

# New Pickling Line with giant Monel hooks cuts costs–increases production

The Pittsburgh Screw And Bolt Corporation, one of the world's largest producers of steel screws and bolts, wanted increased production.

To reach that goal they needed a new pickling line for the wire used in the automatic machines that make their products.

The plans called for something special in pickling hooks — hooks measuring 18 feet in length and capable of carrying a work load of 6000 pounds of coiled wire (almost a ton more than most hooks).

Naturally, they wanted hooks that would stand up under the load and the service conditions in 8 to 10% sulfuric acid solutions at 160 to 180° F.

That's why they turned to high strength, corrosion-resisting Monel®.

And, they found that Monel had the strength and stiffness it takes — with a full load the hooks showed a deflection at the end of two inches despite their comparatively light weight.

The new pickling line, using ten of the giant Monel hooks, is more productive than their old installation . . . yet costs even less to operate. And with Monel on the job, the Pittsburgh Screw And Bolt Corporation can count on long, profitable service life from their pickling equipment.

If you are contemplating new pickling equipment it will pay you to consider Monel. Many of the nation's leading plants have reported Monel pickling equipment still in good condition after more than ten years in service. In addition to high strength and corrosion resistance, Monel offers workability. It can be fabricated and welded by conventional methods without special tools or equipment.

For more information on Monel, write Inco's Technical Service Section. And ask for a copy of "5-Way Savings in Pickling."

**THE INTERNATIONAL NICKEL COMPANY, INC.**
67 Wall Street New York 5, N. Y.

INCO TRADE MARK

**Monel**
**PICKLING EQUIPMENT**

extra life
extra capacity
extra safety

STEEL

April 5, 1954

# Metalworking Outlook

## Is the Worst Past?

The worst three months of 1954 are past us. There will probably be no marked upturn until next fall, but the next six months should see a gentle rise, supported by surprisingly large construction expenditures, near-record outlays for equipment, the traditional spring quickening in consumer sales and the end of most inventory liquidations. Trouble points, of course, will continue for the rest of the year. The worst is unemployment, but remember that the latest count of 3.7 million is still 1 million fewer than the February, 1950, total of 4.7 million.

## Excises, Communications and Travel

The reduced excise taxes will cut your company's costs immediately for telephoning, telegraphing and traveling by rail or air. A Cleveland metalworking firm had a phone bill of $1160.13 in a typical month before the levy was cut Apr. 1. That same amount of telephoning will cost $1014.27 now. The average cost of direct wire telegraph service was $250 a month to metalworking firms. It will be $233.75 now. United Airlines charged $51.87 for a one-way flight from Chicago to New York. The new price is $49.61. New York Central one-way Pullman fares were $17.03 from Chicago to New York. They are $44.98 now.

## Enough Nickel by 1960

The nickel shortage today is hurting (p. 59), but there's hope for relief over the long pull. Total free world nickel output by 1960 is expected to be at least 75 per cent greater than in 1949. In 1953, production of about 170,000 tons was 25 per cent above 1949. The current shortage of the metal has ramifications far beyond just nickel users. Zinc diecasters, for example, are hit. Automakers and other buyers of their product often require that the diecastings be nickel plated. Rather than risk a bottleneck there, automen are sometimes specifying components made by other techniques.

## Iron and Nickel

Technical developments now under study may put iron ore and steel companies in the nickel business and nickel companies in the iron ore field. Bethlehem Steel Co. is experimenting with nickel recovery from iron ore mined in Cuba. And International Nickel Co. is beginning construction of a $16-million plant near Copper Cliff, Ont., which will treat 1000 tons a day of nickel-bearing pyrrhotite, ultimately to yield about 1 million tons of 65-per-cent iron ore a year, in addition to nickel. Inco hopes to get a premium price for the iron for direct use in open-hearth and electric steel furnaces. Full-scale operations are probably two years away.

## Double Talk in Labor

The Senate Labor Committee last week finally wrote its Taft-Hartley amendments. The language of the measure is filled with double-talk. If the bill in its present form gets approved by both houses, which is doubtful, noth-

ing too drastic will be done to change T-H. The House still wrestles with its proposals which promise to be more forthright and for that reason even more unlikely to find full Congressional approval.

## Companies of Note

Kaiser Aluminum & Chemical Corp. is planning a complete melting and finishing aluminum plant on the Ohio river . . . Crane Co. has already introduced, or soon will, new lines of alloy steel valves, oil field valves, water works valves, plastic tubing and fittings, lavatories, closets, plumbing valves and trim . . . Thomas Strip Division of Pittsburgh Steel Co. expects to market later this year a plastic-coated strip that will withstand the most severe drawing and stamping operations . . . Armco Steel Corp. predicts a marked increase in sales of its aluminized steel to be used in such items as clothes driers and auto mufflers.

## Tariffs Are the Trouble

The tariff-reduction proposals of President Eisenhower's foreign policy suggestions will meet the stiffest opposition in Congress. His program, following closely the recommendations of Clarence B. Randall's Commission on Foreign Economic Policy, calls for curtailment of foreign aid, encouragement of investment, facilitation of currency convertability and expansion of trade.

## FCC Gets Tough

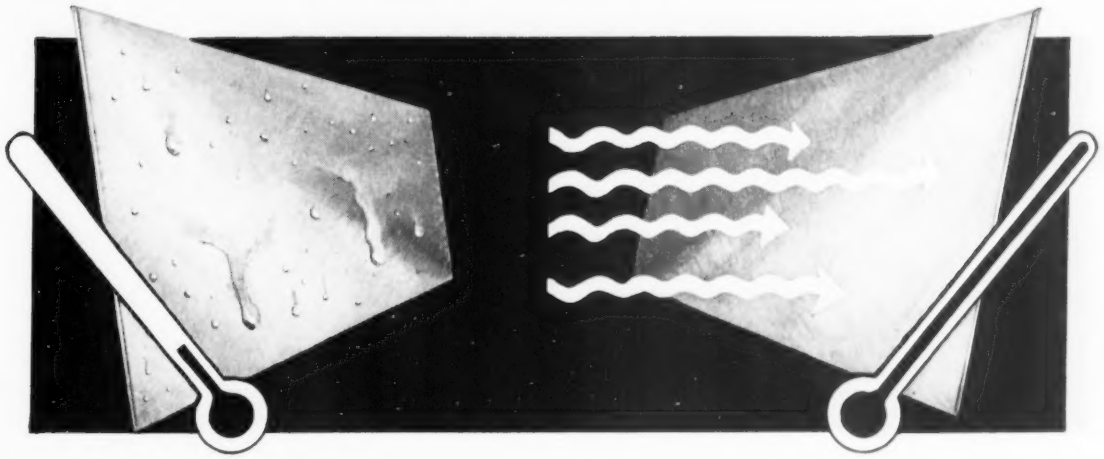
Are you operating your induction heating equipment in conformity with Federal Communication Commission rules? Those require certification or licensing. FCC is getting after violators and has ordered a Brooklyn company to cease and desist from operating equipment in violation of Part 18 of the regulations.

## Straws in the Wind

The Renegotiation Board extends until further notice the time for contractors having a fiscal year ending in 1954 to file financial statements; contractors whose year ended last Dec. 31 have until May 1, 1954, to file . . . Atomic authorities predict competitive atomic power will be a reality in the U.S. within the next ten years . . . Allegheny Ludlum Steel Corp. plans to spend $13 million in 1954 for capital improvements, compared with $10.5 million in 1953 and $18.1 million in 1952 . . . Steel and pig iron production at the Steelton, Pa., works of Bethlehem Steel Co. will be suspended Apr. 17 for "several weeks" to reconstruct the 44-inch blooming mill and make other repairs . . . William Kerber is on leave as a Great Lakes Steel Corp. vice president to become director of the Iron & Steel Division of Business & Defense Services Administration.

## This Week in Metalworking

Components inventories bounce near the bottom (p. 57) . . . Components prices are fairly stable, but on a mild downward trend (p. 57) . . . The steel industry's 1953 sales hit a peak, but profits were under the 1950 high (p. 63) . . . Steelworkers' President David J. McDonald presents a case for the guaranteed annual wage (p. 60) . . . Not everyone should lease, but everyone should consider the possibilities (p. 67 for Part II in a three-part series) . . . Simplification of the Defense Materials System will eliminate 90 per cent of the paperwork (p. 69).



# RESISTS HEAT BETTER THAN ANY METAL IN ITS PRICE CLASS!

Better than any metal in or near its price for cyclic high temperature heating and cooling service! That's what independent tests show for Armco ALUMINIZED Steel, sheet steel coated in a bath of molten aluminum by a patented process.

**ENDURANCE AT HIGH TEMPERATURES**

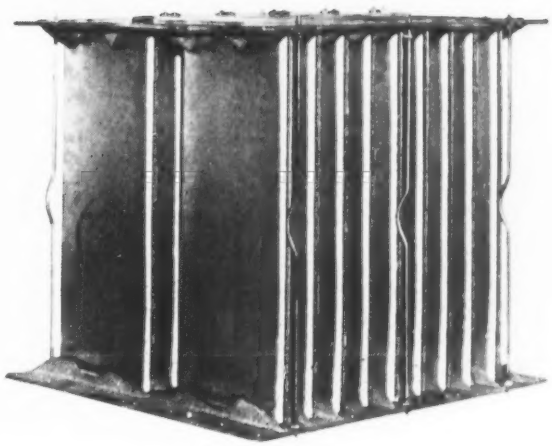
In these tests, Armco ALUMINIZED Steel was exposed to burning sulfur-bearing gases at temperatures up to 1325 degrees F. Results showed lower maximum and average rates of penetration in mils per year than any other metal near its cost.

**RESISTS PRODUCTS OF COMBUSTION**

When heated to as high as 825 degrees F, then cooled to 80 F in cyclic tests, Armco ALUMINIZED Steel showed many times the resistance of any competitively priced metal—to heat, and to the mixture of the products of combustion of sulfur-bearing gases and the condensate that forms on cooling.

**PROVED IN SERVICE**

These tests explain the many years of successful service obtained from Armco ALUMINIZED Steel in combustion chambers and heat exchangers. Besides being used for heat- and corrosion-resistance, this Armco Special-Purpose Steel is widely used for heat reflection. For further information on Armco ALUMINIZED Steel, just fill out the coupon and mail it to us.



The core of a gas-burning industrial heater—the heat-exchanger tube assembly. The tubes are made of Armco ALUMINIZED Steel for resistance to oxidation at elevated temperatures, and to the condensate that forms on cooling.

ARMCO STEEL CORPORATION
2244 Curtis Street
Middletown, Ohio

Send me information on Armco ALUMINIZED Steel for

- ☐ Heat- and Corrosion-Resistance
- ☐ Heat Reflectivity

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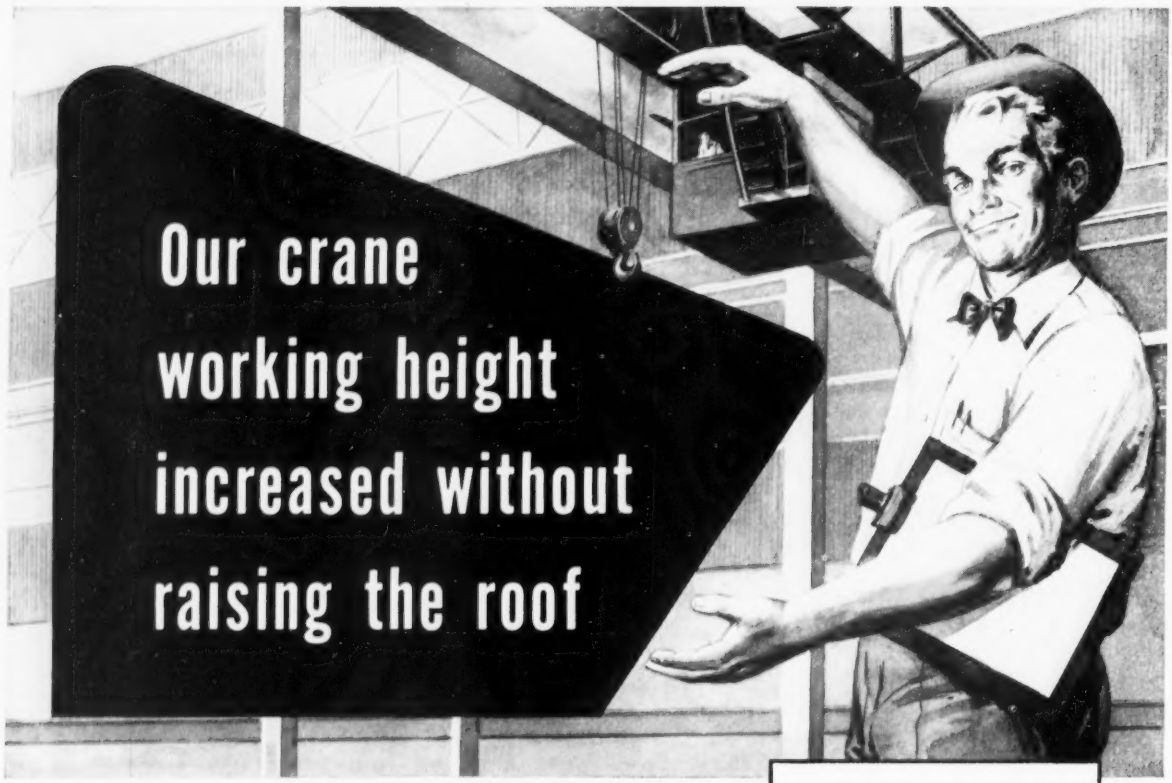
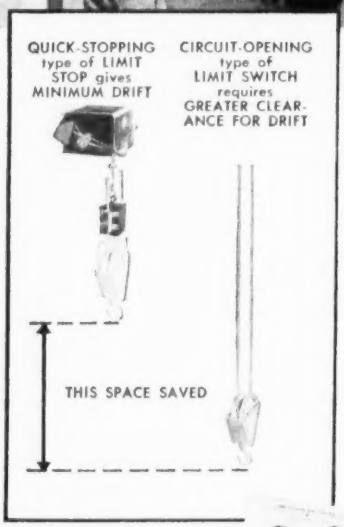



## WITH EC&M YOUNGSTOWN SAFETY LIMIT STOPS

"We frequently needed more headroom on our D-c cranes. The limit stop setting couldn't be raised without sacrificing the clearance needed by the hoist-brake to safely stop the fast-moving empty hook, which hoists 2½ to 3 times faster than when hoisting full load. We had a choice . . . we could raise the roof . . . which meant deeper footings, heavier building columns and increased costs for lighting, heating and ventilating . . . OR . . . we could equip our cranes with **quick-stopping** EC&M Youngstown Safety Limit Stops."

Yes, Youngstown Hoist Limit Stops not only disconnect power from the motor but also apply **dynamic braking** to aid the hoist-brake in a **quick stop** . . . giving less drift . . . more headroom. **Safe,** too, because the tripping point does not change . . . is not affected by stretching of the hoist cables. The point at which the rising crane-hook makes contact to lift the Youngstown suspended-weight always remains the same.

For increased D-c crane headroom, **plus safety,** investigate EC&M Youngstown Safety Limit Stops.


QUICK-STOPPING type of LIMIT STOP gives MINIMUM DRIFT
CIRCUIT-OPENING type of LIMIT SWITCH requires GREATER CLEARANCE FOR DRIFT
THIS SPACE SAVED

Write today for Bulletin 1032 which describes and illustrates EC&M Youngstown Limit Stops.

3778

**YOU CAN LIFT LOADS HIGHER AND SAFER WITH EC&M YOUNGSTOWN SAFETY LIMIT STOPS**

**THE ELECTRIC CONTROLLER & MFG. CO.**
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# New Look Needed

Last week the news services put out dispatches from London to the effect that United States Foreign Operations Administrator Harold E. Stassen had advised representatives of Great Britain and France to go ahead with their plans to increase their trade with countries behind the "iron curtain." His only reservations were to restrict this trade to nonstrategic goods and to hold back, wherever possible, until the Communists give better proof of peaceful intentions.

While this policy is not too clearly defined in anything that has come out of official Washington thus far, the mere fact that Mr. Stassen has given the nod to a freer flow of trade between the western nations and the Communist states and their satellites is an indication that the United States at long last is beginning to take a more realistic view toward foreign trade.

Throughout the years that our thinking on the subject has been influenced heavily by diplomatic considerations, our nation has become almost blind to the economic realities involved. While the State department was virtually dictating American foreign trade policy there was little opportunity for anybody in Washington to do anything constructive to help to offset the terrific damage done by World War II to natural trade relations in several key spots throughout the world.

The war left a void in the trade throughout Europe of which Germany was the center. In the Far East it left Japan shorn of its one-time trade with the Asiatic mainland. Also, after the end of the fighting war and as the Soviet-inspired cold war began, trade between the United States and Russia, which had assumed brisk proportions, came to an abrupt stop.

One would think that restoration of natural trade wherever possible would be one of the most promising things that could become a major factor in promoting peace. There was a time when foreign trade was quite definitely divorced from international politics. Perhaps what we need in the United States today is a new look at foreign trade policy in which we place much more emphasis upon economic realities and much less upon diplomatic theories.

E. L. Shaner

EDITOR-IN-CHIEF

**THE McDONALD VIEW:** In this issue is a statement by David J. McDonald, head of the United Steelworkers of America, in which (p. 60) he outlines his thinking on the so-called guaranteed annual wage or, more accurately, supplementary unemployment compensation;

the editors of this publication intend to present the views of other interested persons on this subject in future issues.

The widest possible discussion of this proposed step in supplementary unemployment compensation should be encouraged for several reasons. For one thing, many important details of it are misunderstood in many quarters. For another thing, the ultimate results of the proposal, if it were put into effect, have not been thought out thoroughly. A lot of study must go into consideration of GAW before proponents or opponents will be in a position to discuss it with a satisfactory degree of intelligence.

* * *

**HELPS ALL COMPANIES:** From the standpoint of most companies in the metalworking industry the most direct result of the change in excise tax rates which went into effect last Thursday will be reductions in the cost of doing business. Easing the tax on domestic telegraph charges, local telephone calls and passenger fares on trains, planes and busses from 15 to 10 per cent will affect practically every company favorably. In many instances the reduction in the tax on long distance telephone calls, and leased wire teletypewriter or talking circuit special service from 25 to 10 per cent will result in important savings. Another tax cut that will affect the operating expense of every corporation is the slice from 20 to 10 per cent in the tax on electric light bulbs.

Excise taxes on essential services such as communications, travel and illumination can be justified only during the most acute of emergencies. It is a pity that conditions today do not permit a complete eradication of these excises.

* * *

**CONFIDENCE IS FACTOR:** Aside from the direct savings that will result from the reduction of excise taxes, there are possibilities that the cut in taxes on the products of manufacturers may stimulate buying. It remains to be seen just how much a reduction in the excise tax on household appliances from 10 to 5 per cent will be an incentive for reluctant prospective customers to buy.

This halving of the tax applies to almost every household convenience, including refrigerators, water heaters, toasters, clothes dryers, home freezers, power lawn mowers, dishwashers, garbage disposals, mangles and flat irons. Shortly after President Eisenhower signed the bill last Wednesday, appliance manufacturers began to announce over radio and television that they would pass on the tax saving to consumers.

The cut from 10 to 5 per cent in itself probably will not be too much of an incentive, but should it happen to be timed with a renewal of confidence in the business outlook, it could be a powerful tonic.

* * *

**CHECK WASTE DISPOSAL:** Last Sept. 10 an explosion ripped up about a mile of West 117th street, which divides Cleveland from Lakewood, O. One life was lost, scores of persons were injured and property damage exceeded a million dollars. Almost immediately a committee of competent engineers was appointed to investigate the cause of the explosion. After six months of exhaustive study, the committee has issued a report which should interest every industrial company that finds it necessary to discharge industrial waste into public sewers.

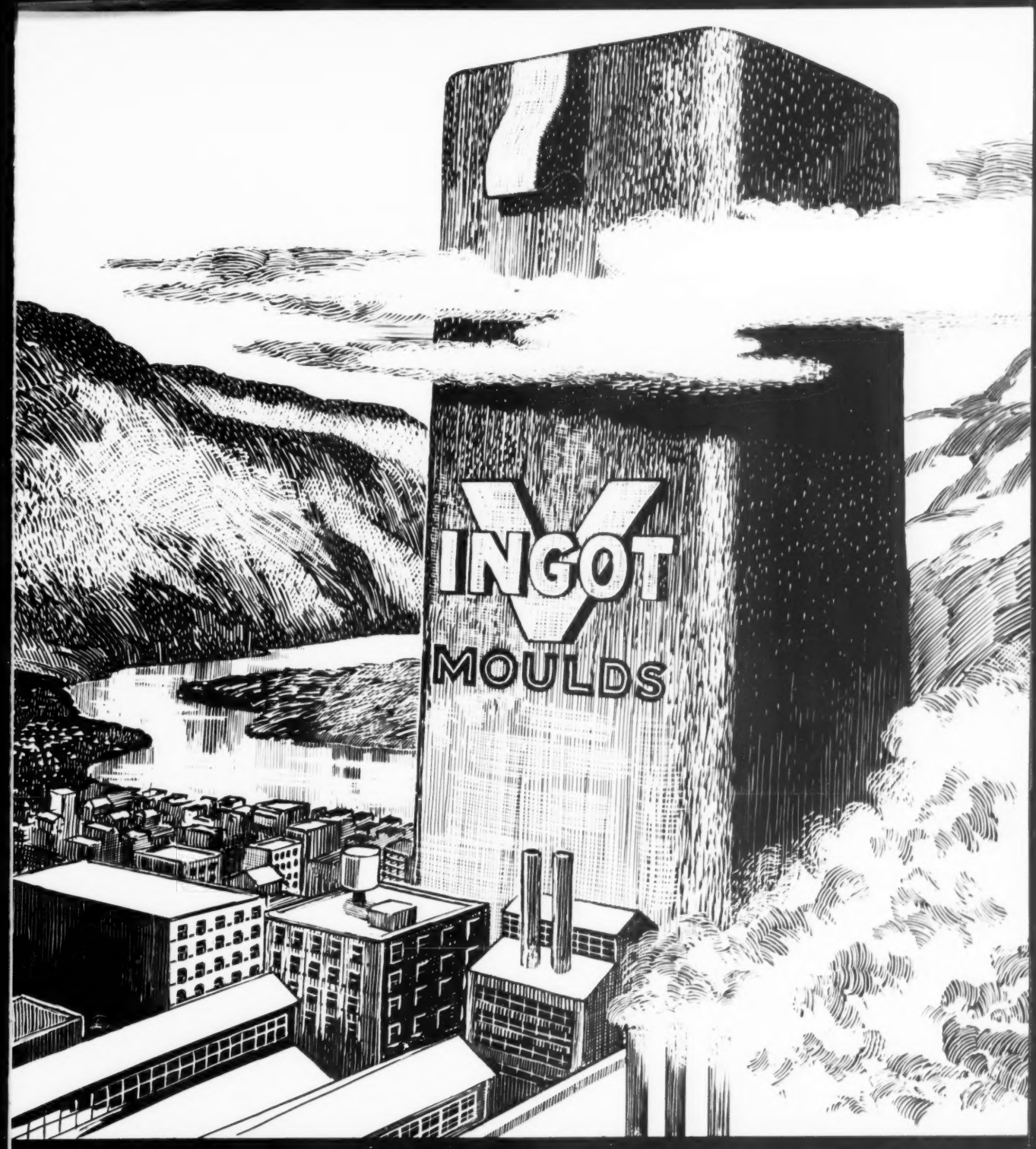
One paragraph of the report reads as follows: "Industrial wastes of potentially destructive nature were found to be carried by the sewage from day to day in sufficient quantity to account for the blast under conditions of protracted dry spell and poorly ventilated sewers."

This condition will exist in many places next summer. Why not check into waste disposal now and take steps to remove known hazards!

* * *

**WATER MENACE ACUTE:** During the winter months we have witnessed twice or perhaps three times as many meetings and conferences on water supply as in any previous year. These assemblies have been particularly notable in industrial areas. They are the natural result of an alarming shortage of water that was emphasized by drought conditions in many industrial centers last summer and of a rather belated realization on the part of responsible civic and industrial leaders that the water problem either has been neglected or underrated.

At long last, industrialists are alive to the urgency of water supply, of conservation and of prevention of water pollution. Fortunately a few alert industrial executives see this problem so clearly that they are in the vanguard of the army that is seeking a satisfactory solution to the grave menace of water shortage.

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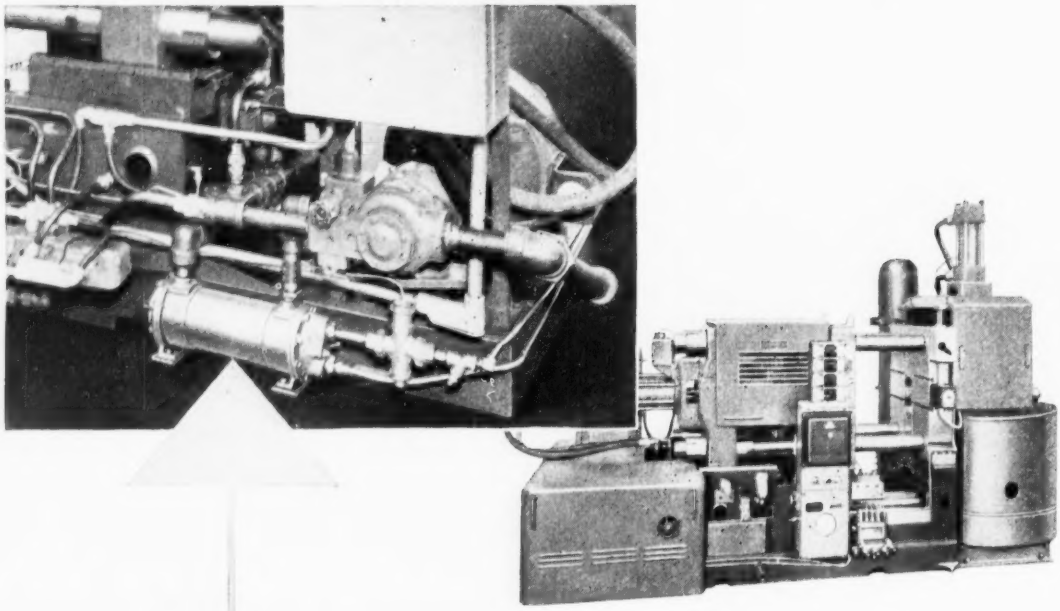
# STANDARD EQUIPMENT

## on this Reed-Prentice Die Casting Machine



## a ROSS EXCHANGER for cooling hydraulic oil

Producing zinc castings weighing up to 10½ lbs., this Reed-Prentice No. 1½ Die Casting Machine has been designed to apply a locking pressure of 250 tons.

To insure total 34.6 gpm pump capacity at 1000 psi, by preventing slippage from overheated, thinned, hydraulic oil, a Ross Type BCF Exchanger has been installed. *Dependable cooling is assured!*

"Over the years, we have found that Ross Exchangers live up to the high standards we set for our die casting machines . . . they provide trouble-free operation in long service," states Reed-Prentice Corporation.

Testifying to the high thermal efficiency and extreme ruggedness of Ross Exchangers are numerous other leading manufacturers of many types of hydraulic machinery. They, too, have found these pre-engineered, fully standardized all-copper and copper alloy units unsurpassed in meeting their requirements readily.

For detailed information, request Bulletin 1.1K5.

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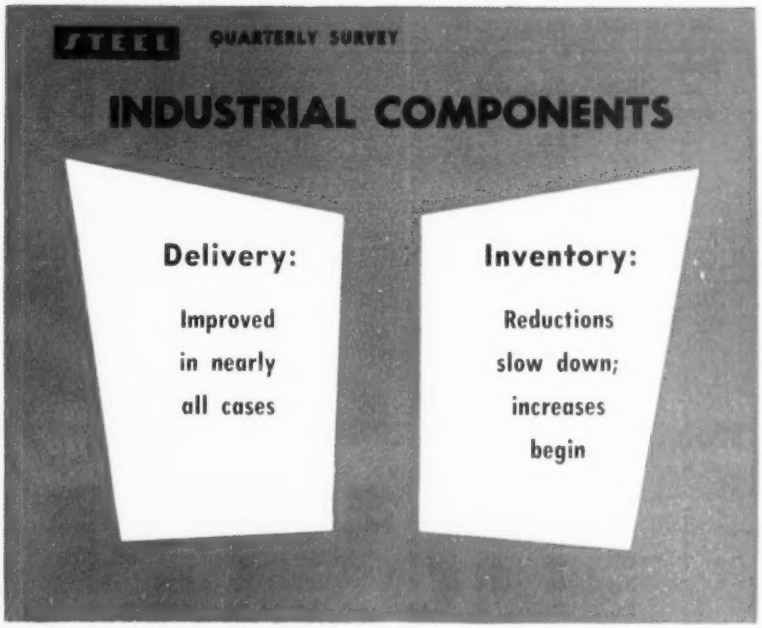



# Inventories Bounce Near Bottom

**Main trend is still downward for components inventories, though at decelerating rate. Countertrend of scattered inventory increases is developing. Delivery improves**

THE BOTTOM of the inventory adjustment in components may be nearly reached, STEEL's latest survey of components indicates.

Inventory levels are still going down generally but not quite so fast nor quite so far as they were late last year. In fact, there are signs of some springiness in component inventories where manufacturers went below minimum workable levels.

**The Driver's Seat**—On the whole deliveries are not nearly the critical influence in buying decisions that they were a year ago. But with many manufacturers keeping only minimum inventories, delivery remains an important factor.

Specifically, 100 per cent of the respondents to STEEL's latest Quarterly Survey confirm that their inventory position has improved over last year. Nine out of ten respondents say that their present inventories are adequate. About 35 per cent of the respondents are influenced by promises of quicker delivery. That's up about 12 per cent from three months ago but well under the 50 per cent so swayed a year ago.

**Countertrend**—Indications that manufacturers may be seeking a higher level for their minimum inventories can be seen in the table on p. 58. In belting and belt drives, for example, 17 per cent of the respondents in January, 1954, held an inventory of less than 10 days. Now that's down to 5 per cent of respondents, and inventories in the one-to-three-months position gained 21 per cent. In air and hydraulic cylinders, inventory positions of one-to-two-months size picked up in 16 per cent of the firms quizzed by STEEL while both larger and smaller inventories of those products were held by 17 per cent fewer companies.

There may yet be some reductions in components inventories. But watch the countertrend of scattered increases in inventory levels. Manufacturers seeking the optimum level of components inventories for today's business conditions are finding that the lowest is not always the best.

## Prices Ride a Plateau

**Components price lists show stability but concessions are shading final costs**

LIKE GOOD HOUSEWIVES, manufacturers are finding it pays to shop around before buying these days.

Upward pressure on industrial components prices lost most of its steam within the past six months, but significant cuts in list prices aren't in the books either (see table at right).

**Price Concessions**—Manufactur-

**WHOLESALE PRICE INDEXES OF KEY COMPONENTS**

(1947-49 = 100)

| | Castings & forgings | Motors & generators | Fasteners & nonstructural metal products | Belts & belting |
|---|---|---|---|---|
| Feb., 1954 | 129.4 | 124.3 | 126.5 | 127.6 |
| Jan., 1954 | 129.5 | 124.3 | 127.2 | 127.6 |
| Dec., 1953 | 129.3 | 124.3 | 127.2 | 127.1 |
| Nov., 1953 | 129.3 | 124.3 | 127.2 | 127.1 |
| Oct., 1953 | 129.0 | 124.3 | 127.2 | 127.1 |
| Sept., 1953 | 128.9 | 124.3 | 127.3 | 127.1 |
| Aug., 1953 | 128.2 | 124.7 | 126.3 | 127.1 |
| July, 1953 | 127.2 | 124.7 | 125.5 | 128.5 |
| June, 1953 | 126.6 | 124.7 | 124.1 | 128.5 |
| May, 1953 | 125.5 | 122.8 | 123.6 | 125.9 |
| Apr., 1953 | 124.0 | 120.4 | 122.8 | 125.9 |
| Mar., 1953 | 124.0 | 120.2 | 122.2 | 124.6 |
| Feb., 1953 | 123.8 | 119.9 | 126.7 | 124.6 |
| Jan., 1953 | 121.1 | 119.7 | 126.3 | 124.6 |
| (Av.) 1952 | 119.9 | 120.1 | 124.9 | 127.6 |

Source: Bureau of Labor Statistics

## Latest Components Picture as Seen by STEEL's Quarterly Survey

(Figures are percentages of those replying to the questionnaire)

| COMPONENTS | INVENTORY POSITION | | | | | BEST DELIVERY | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Under 10 days | 10-30 days | 30-60 days | 60-90 days | 3-6 mos. | Under 10 days | 10-30 days | 30-60 days | 60-90 days | 3-6 mos. |
| **Antifriction bearings (This quarter)** | **5** | **34** | **34** | **22** | **5** | **29** | **41** | **13** | **10** | **7** |
| (Last quarter) | 8 | 26 | 32 | 24 | 10 | 22 | 39 | 19 | 11 | 9 |
| **Belting, belt drives** | **4** | **44** | **48** | **4** | | **41** | **59** | | | |
| | 17 | 38 | 33 | 2 | 10 | 58 | 30 | 12 | | |
| **Castings, die** | | **24** | **52** | **24** | | **4** | **54** | **34** | **8** | |
| | | 14 | 57 | 24 | 5 | | 50 | 45 | 5 | |
| **Castings, gray iron** | **4** | **35** | **47** | **14** | | **27** | **61** | **10** | **2** | |
| | 2 | 35 | 51 | 8 | 4 | 17 | 57 | 24 | 2 | |
| **Castings, malleable** | | **25** | **58** | **13** | **4** | **4** | **36** | **56** | **4** | |
| | 3 | 16 | 58 | 20 | 3 | | 32 | 64 | 4 | |
| **Castings, nonferrous** | **7** | **37** | **41** | **15** | | **30** | **50** | **17** | **3** | |
| | 3 | 41 | 47 | 6 | 3 | 16 | 61 | 20 | 3 | |
| **Castings, steel** | **4** | **21** | **69** | **3** | **3** | **7** | **52** | **38** | **3** | |
| | 3 | 32 | 52 | 10 | 3 | 7 | 50 | 40 | 3 | |
| **Couplings, hose** | **8** | **56** | **32** | **4** | | **42** | **37** | **21** | | |
| | 9 | 27 | 45 | 14 | 5 | 46 | 38 | 12 | 4 | |
| **Cylinders, air, hydraulic** | **6** | **24** | **40** | **24** | **6** | **24** | **29** | **38** | **9** | |
| | 5 | 35 | 25 | 30 | 5 | 13 | 39 | 35 | 13 | |
| **Electric equipment** | **7** | **26** | **48** | **15** | **4** | **19** | **51** | **22** | **8** | |
| | 3 | 32 | 43 | 14 | 8 | 17 | 33 | 28 | 22 | |
| **Electric motors (fractional)** | **25** | **25** | **29** | **8** | **13** | **26** | **33** | **30** | **7** | **4** |
| | 4 | 41 | 24 | 17 | 14 | 23 | 48 | 16 | 13 | |
| **Electric motors (1-5 hp)** | **29** | **38** | **29** | | **4** | **40** | **28** | **24** | **8** | |
| | 15 | 30 | 33 | 11 | 11 | 37 | 44 | 15 | 4 | |
| **Electric motors (over 5 hp)** | **22** | **43** | **7** | **7** | **21** | **22** | **34** | **22** | **22** | |
| | 21 | 37 | 16 | 10 | 16 | 26 | 58 | 5 | 11 | |
| **Fasteners** | **2** | **32** | **49** | **15** | **2** | **28** | **50** | **15** | **7** | |
| | 2 | 28 | 48 | 15 | 7 | 20 | 56 | 22 | 2 | |
| **Forgings** | **3** | **30** | **34** | **27** | **6** | | **44** | **34** | **13** | **9** |
| | | 27 | 43 | 20 | 10 | | 46 | 38 | 8 | 8 |
| **Gears** | | **29** | **50** | **21** | | **16** | **36** | **32** | **10** | **6** |
| | | 27 | 29 | 32 | 12 | 3 | 26 | 35 | 23 | 13 |
| **Rubber Goods, mechanical** | **9** | **34** | **42** | **15** | | **29** | **34** | **31** | **6** | |
| | 8 | 35 | 38 | 14 | 5 | 19 | 42 | 36 | 3 | |
| **Screw machine products** | **2** | **29** | **39** | **25** | **5** | **13** | **51** | **31** | **3** | **2** |
| | 2 | 25 | 51 | 14 | 8 | 9 | 52 | 31 | 8 | |
| **Springs, wire shapes** | **3** | **14** | **65** | **9** | **9** | **16** | **33** | **49** | | **2** |
| | 4 | 19 | 50 | 21 | 6 | 7 | 47 | 33 | 11 | 2 |
| **Stampings** | | **37** | **46** | **17** | | **5** | **59** | **32** | **4** | |
| | 3 | 19 | 45 | 23 | 10 | 7 | 48 | 39 | 6 | |
| **Weldments** | **14** | **29** | **50** | | **7** | **19** | **50** | **25** | **6** | |
| | 27 | 20 | 47 | | 6 | 15 | 39 | 38 | 8 | |

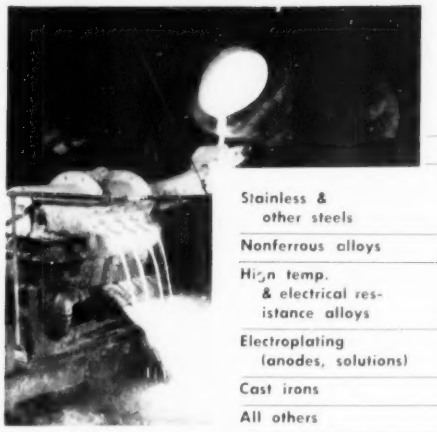
ers are finding that they can get various price concessions, however, which result in their getting the same components as last year at less total cost. These concessions take the form of freight absorption, elimination of extras and premiums, quicker delivery which reduces the need for large inventories at the manufacturer's level, and, perhaps, shaved prices for quantity orders.

"Generally prices are better than last fall," says one midwestern auto supplier. "It's due mainly to improved supply which creates opportunities to shop around and to buy on long-range planning. Nothing spectacular but it does result in lower prices."

Supporting prices of components under the weight of increased competition are labor and materials costs. Standard base prices on steel have reflected no important change. Prices on some other products—notably lead and zinc—have recently done an about-face and are heading upward. Labor costs, despite less overtime and higher productivity, impart a good deal of rigidity to prices.

**Closer Look**—How long these factors can hold back an erosion in prices remains to be seen. As the table on p. 57 indicates, fastener, casting and forging prices slipped slightly in February. Drop forging prices have declined 10 per cent in the last six months, and some in the industry fear they haven't touched bottom yet.

Belts and belting prices are higher than a year ago but have been stable within the past six months. Antifriction bearings have increased from 3 to 5 per cent in price over a year ago but are neither higher nor lower than six months ago, in the opinion of one large manufacturer.



**HOW NICKEL CONSUMPTION PATTERN HAS SHIFTED**

(per cent of supply consumed by uses, exclusive of scrap)

| | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953* |
|---|---|---|---|---|---|---|---|---|---|
| Stainless & other steels | 57.8 | 42.0 | 40.5 | 40.7 | 37.1 | 39.2 | 44.2 | 44.9 | 39.8 |
| Nonferrous alloys | 27.4 | 32.3 | 33.9 | 29.9 | 27.8 | 28.4 | 30.5 | 30.9 | 28.4 |
| High temp. & electrical resistance alloys | 4.1 | 8.5 | 6.4 | 6.6 | 5.9 | 5.7 | 8.6 | 7.9 | 7.6 |
| Electroplating (anodes, solutions) | 6.6 | 11.0 | 11.9 | 15.9 | 21.3 | 18.3 | 7.2 | 7.1 | 14.4 |
| Cast irons | 3.1 | 3.7 | 4.9 | 4.5 | 5.0 | 4.9 | 4.3 | 5.6 | 4.1 |
| All others | 1.0 | 2.5 | 2.4 | 2.4 | 2.9 | 3.5 | 5.2 | 3.6 | 5.7 |
| TOTAL CONSUMPTION, Net Tons | 96,252 | 80,105 | 80,757 | 93,558 | 68,326 | 98,904, | 86,416 | 101,047 | 104,781 |

Source: Minerals Yearbook, Bureau of Mines

*Preliminary

# Nickel Pickle Continues in Second Quarter

**Users don't want a return of government controls even though the total nickel to be available in 1954 will probably be less than in 1953**

CIVILIAN nickel supply will tighten sharply in the second quarter unless plans now afoot for holding at least to present levels succeed.

Under discussion in Washington is a proposal by nickel producers to maintain shipments to nondefense industry at levels equal to or higher than those of the past eight months. Look for defense mobilizers to decide this month between adherence to a firm schedule of stockpiling and recognition of civilian needs.

**Downward**—April nickel allotments, released last week, will be a shade under March and below the average since decontrol. May and June could be down still more, depending on the military load. Erratic requirements for defense will keep users on a hot griddle for months.

Despite lean stockpiling since Korea, civilian consumers today are hard pressed for the metal. A combination of reduced military demands, slower business and a windfall of 3 million pounds of unsold fourth-quarter production from the government plant at Nicaro, Cuba, provided them with just enough in the first quarter.

**The Trouble**—But with additional stockpiling scheduled, the Nicaro bonus spent and the demand for nickel showing signs of increasing, the supply picture could be bleak.

Defense Mobilizer Arthur S. Flemming predicts that the 1954 civilian nickel supply will be about the same as in 1953. He foresees deliveries of 173 million pounds this year, compared with 197 million pounds last year. He says civilians won't feel the 24-million-pound decrease because defense needs will be reduced by about that much. Some industry men are skeptical.

**Peak Output**—Last year only electroplaters and cast iron foundries got less nickel than in 1950 as consumption reached a new high of 104,781 tons (see table). Gains over 1952 were most pronounced for engineering alloy steels, anodes and cast irons. Somewhat more nickel was also used in high-temperature and electrical resistance alloys, ceramics and magnets. Use of nickel in stainless steel declined substantially from 1952, and consumption was off in nonferrous metals and catalysts.

Further tautness in nickel supply would jeopardize operations of all these consumers. Comments a stainless steel producer: "The only reason there's no nickel shortage with us is that we're operating at 55 per cent of capacity." Warns another: "Under normal operations we would be out of nickel in a month."

**Special Troubles** — Nonferrous alloy producers have a problem all their own. They don't have enough nickel to return to pre-Korea alloys, such as the 18-22 per cent nickel silvers. Their customers fear buying the 10-12 per cent alloys because of poor color match or other objections.

Plating material suppliers are operating on a month-to-month basis, and their gripes have touched off several Washington investigations of shortages. January deliveries of nickel to platers were substantially below December, and February was below January. March showed a little recovery but April, May and June quotas could be off sharply from March, say plating men.

According to Mines Bureau figures, nickel consumed in anodes last year doubled 1952 totals. Some industry men say the use percentages presented by platers to bolster their demands for a greater share of supply are depressed because of differing base periods, and that last year platers got some 50 per cent of their 1949-50 average instead of the 32.5 per cent of base alleged.

Platers' projected annual consumption rate of 24 million pounds of nickel in 1954 compares with 36 million pounds in 1950 and 29 million pounds in 1949.

Although nickel shortages continue and a gray market is operating, most consumers don't want government controls reimposed. They feel they're getting more equitable distribution under private allocation.

*GAW needs more precise definition . . .*

*It is part of search for continuity of employment*

## The Case for the—

# GUARANTEED ANNUAL WAGE

By DAVID J. McDONALD
*President*
United Steelworkers of America

THE term "guaranteed annual wage" means different things to different people. Because of this difference, we all seem to be talking about something which we are not talking about at all. Consequently, if someone would come up with a more precise title or definition, it would be helpful. But, in a broad way, I might be able to highlight some of the thinking of the United Steelworkers of America on the subject.

The postwar planning of the steel industry has been extremely successful for the steel industry. The current year, 1954, looks like a good year for the steel industry but not so good a year for the steelworkers and their families who suffer from short work weeks and unemployment. The industry has been able to develop a set of conditions whereby sharp curtailments in production still enable the industry to account for very substantial profits.

**Industry Strong**—It is a token of the industry's strength and vitality that it can enjoy prosperity amidst recession. But it is bad for America if the industry is satisfied to hold on to its own prosperity and disregard its workers and the total welfare of the nation.

It is here that industry and business face a challenge.

If the industry uses its great strength and good health to move ahead boldly, then we can all rejoice. The industry can move ahead by providing more purchasing power to its own workers which in turn will influence other employers to do likewise. This would substantially bolster the power and vitality of the consumer and influence business and production upwards.

**What Union Wants**—Without going into detail on this point it seems obvious that further enhancement of the individual American's ability to buy should be obtained by support of at least a minimum program of federal and state legislation to provide lower income taxes on wage and salary earners in the low and middle income brackets by increasing personal exemptions; reducing excise taxes; higher social security benefits and increasing the minimum wage; housing; long-range public works; increasing workmen's compensation; and a substantial improvement in our state unemployment compensation laws. The present state unemployment benefit programs are so completely inadequate that, in addition to the improvements being discussed, wage guarantees tailored to fit the needs of each industry through collective bargaining are required in order to provide at least minimum protection to workers laid off by industry.

Perhaps we are also confronted with the necessity for a reduced

*Workers suffer from short work weeks, unemployment . . .*

*GAW would help keep wheels of industry turning*

**Top topic at forthcoming labor-management bargaining sessions will be the guaranteed annual wage, or, more accurately, supplementary unemployment compensation. The issue is widely misunderstood. Its cost implications are serious.**

**STEEL asked Mr. McDonald to present the union's case for the GAW to more clearly define the issue. In coming weeks, STEEL will present other viewpoints. What are yours?**

**—The Editors**

work day with maintenance of wage income.

**What Is GAW**—But let us look a little more at this "supplementary unemployment compensation" or, if you will, the guaranteed annual wage.

Now there is nothing fundamentally revolutionary about the concept of wage guarantees. It is a well-known method of compensation in various fields. Many groups have a contract for a stipulated annual salary. Nor is the idea a sudden, out-of-the-blue notion which the United Steelworkers proposes, but a practical program based on a great deal of serious study and hard work. We have consistently urged it in negotiations with the steel industry since 1943 and for several years and continuing today our union has assigned expert economists to a thorough study of the problems involved and the possible solutions.

There is on record the findings of an advisory board named by President Franklin D. Roosevelt on the subject. This report was submitted in January, 1947, and came about through the recommendation by the National War Labor Board in 1943 for a study of the union's demand for a guaranteed annual wage.

**"Search for Continuity"** — The War Labor Board made this observation: "The question is one which demands investigation. A guaranteed annual wage is one of the main aspirations of American workers. The search for it is a part of the search for continuity of employment which is perhaps the most vital economic and social objective of our times. . . ."

I should like to emphasize a few words from that observation: "The search for continuity of employment. . ." The United Steelworkers is not asking for a dole. We are advocating the true "right-to-work." It is ironic that many of those glibly advocating "right-to-work" in state legislatures beat a hurried retreat when we ask them to give real meaning to the "right-to-work" as a means of strengthening our nation as a whole in its fight against communism and as a means of providing the mass purchasing power which is necessary to keep our economy going.

**Matter for Negotiation** — Even with the long and serious study of the question, the union does not claim that it has all the answers, or that there is only one, ready-made plan, just waiting to be cranked up and set going. From the very beginning the union has emphasized that the wage guarantee plan is a matter of negotiation and co-operative study with industry, a proposal to be hammered into shape at the collective bargaining table.

**Joint Study Asked**—The Wage

Stabilization Board, in 1952, urged that our proposal be made the subject of "joint consideration during the period of the next (1952-1954) contract, with a view to reaching mutual understanding by the time of the next negotiations." The industry was unwilling. And, at the time of the 1953 wage reopening in mid-term of that 1952-1954 contract, the industry refused to agree to a union proposal that the parties set up a joint fact-finding committee to study some of the problems involved in stabilizing employment and in guaranteeing work or at least partial and limited income maintenance when work was not available.

This was not to be a negotiating committee, but a study committee to gather facts for constructive and informed negotiations.

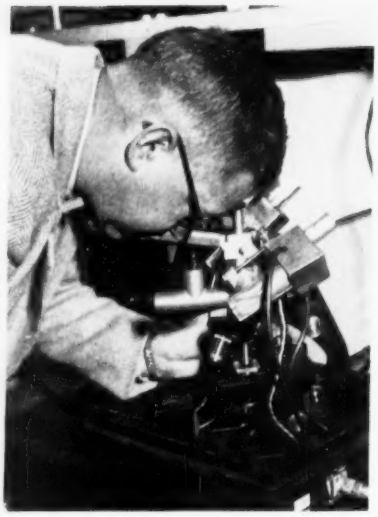
**The Union Proposal**—With this in mind, let us take a look at one of the latest proposals the one submitted to the Aluminum Co. of America in 1953.

First, the focal point of the plan was our proposal that the company should guarantee to every employee with three or more years of service a minimum pay equal to 30 times his standard hourly rate (incentive earnings not included) for each week of layoff for a maximum of 52 weeks.

Second, the union proposed that the company should pay into a trust fund, set up for guaranteed pay, 10 cents per hour for each hour worked by each employee in the bargaining unit. Liability of the companies would be limited to this cents-per-hour contribution. Only such guarantees as it will provide were proposed.

Third and this is an important factor in the union's proposal, the weekly guaranteed layoff payment was to be geared to the federal-state unemployment compensation system.

**Rebutting the Objections** — To the plea that "it can't be done," I simply remind you that the same thing was said about the pension program. To the argument that this is simply "pay for not working," there are many obvious answers; the chief one is that under the union proposal the laid-off worker does not receive his full on-the-job income, but what would amount to somewhere between 60 and 70 per cent of his normal earnings. Further insurance is the proposed contract stipulation that an employee may be disqualified from receiving his layoff pay if he does not register with a public employment office or if he refuses to accept suitable employment, when and if offered.



**Atom Spotter**

Beta ray microscope developed at University of Michigan by William Kerr will help researchers and scientists see how a living or metal structure fits together. It can be used to locate atoms of elements in an alloy

In short, the union's approach to guaranteed pay is not at all the silly notion of "pay for not working" but the opposite and highly important goal of regular work at good rates of pay — in other words, full year-round employment and stable prosperity.

**Geared to State System**—I want to emphasize, again, that the proposal shall be geared into existing unemployment compensation systems. The company would only have to put enough money into the trust fund so that the fund could make up the difference in weekly benefits between what the laid-off worker receives as state-federal unemployment compensation and what is guaranteed under the plan. Thus, in addition to limiting the amount of benefits which must be provided from the fund, it leaves open the possibility that the amounts paid out of the fund — and, therefore, the cost to the company of maintaining such a fund can be reduced even further as improvements are made in federal-state unemployment compensation.

**The Cost**—The second-named proposal in the foundation of the union's plan as proposed to the Aluminum Co. of America — 10 cents per hour per employee to be paid into the trust fund — also meets the "objection" of cost by providing for a fixed amount to be set aside for the payment of guarantees during layoffs. When the union put forth its proposals to the steel industry in 1951-52, one of our experts reported that his studies indicated that something in the neighborhood of seven cents per hour would pay for such a wage guarantee for the steel industry. Since management has refused to bargain on the matter no precise cost figures could be determined.

**No Blank Check**—This necessarily short discussion of the union's proposal for a guaranteed annual income does not, obviously, demand of industry a "blank check" of unlimited obligations and unknown quantity, but sets the following reasonable bounds as a basis for negotiations: 1. It fixes the amount of the company's contribution on a per-hour basis, with this amount subject to reduction in the way the plan actually operates; 2. it ties the program in with the unemployment compensation system and thereby allows for reduction of cost in proportion to improvements in that system; 3. it encourages the company to save on the costs by scheduling operations to give steadier employment; and 4. it sets a maximum time limit on the obligation to guarantee unemployment benefits.

Now, while this is not to claim that the plan alone is a sure-fire preventive of an economic depression, it is to state the conviction that a guaranteed wage program, if widespread in American industry, would sustain the flow of purchasing power to help keep the wheels of industry turning.

## BSDA Urges Defense Speed-up

The nation's critical defense industries were urged by Charles F. Honeywell, administrator of Business & Defense Services, Administration, Department of Commerce,

to speed plans for protecting plants and maintaining essential production in event of enemy attack, sabotage or other disaster.

The BDSA program was devised after extensive consultation with industry and is co-ordinated with activities of Department of Defense and Federal Civil Defense Administration. The 25 industry divisions of BDSA are serving as a reservoir and clearing house of information on the technical aspects of industrial defense such as protection of plants and employees, planning for continuity of production and management, reserve stocks of critical materials and intercompany transfers of production from damaged to undamaged plants.

## House Kills Building Program

A House Appropriations Committee provision for 20,000 new public housing units in fiscal 1955 and 15,000 in fiscal 1956—far below President Eisenhower's recommendation of 35,000 units a year for the next four years—was squelched last week.

Even though the provision was designed to cover only existing contracts, it was eliminated under a house rule that general legislation may not be included in an appropriations bill; new public housing commitments were banned last year by Congress.

But the public housing issue is expected to be revived in the House, and the Senate will probably initiate some public housing program with which the House might go along.

## Federal Building Awards Drop

The value of contracts awarded for new construction financed wholly or in part with federal funds dropped 40 per cent to $2.8 billion last year, estimates the Bureau of Labor Statistics. But even with the $1.9 billion decrease, contract awards last year were still above any postwar year except 1951 and 1952.

Decline in federal industrial and military building accounted for more than half of the decrease. Electrification and conservation and development projects also dropped considerably.

# Steel '53 Sales Hit Peak, but Not Profits

| | NET EARNINGS | | SALES | |
|---|---|---|---|---|
| | 1953 | 1952 | 1953 | 1952 |
| United States Steel Corp. | $222,087,840 | $143,687,746 | $3,861,034,728 | $3,137,397,336 |
| Bethlehem Steel Corp. | 133,947,837 | 90,900,771 | 2,094,952,155 | 1,701,541,383 |
| Republic Steel Corp. | 56,743,547 | 44,274,053 | 1,137,123,547 | 918,447,135 |
| National Steel Corp. | 50,334,130* | 37,559,477 | 634,178,060 | 548,625,817 |
| Armco Steel Corp. | 33,902,462 | 31,337,861 | 588,919,900 | 518,575,218 |
| Inland Steel Co. | 33,867,184 | 23,755,218 | 575,590,771 | 458,043,269 |
| Jones & Laughlin Steel Corp. | 31,015,000 | 19,482,000 | 624,387,000 | 495,401,000 |
| Youngstown Sheet & Tube Co. | 30,839,716 | 22,915,822 | 554,059,088 | 439,623,183 |
| Wheeling Steel Corp. | 12,458,311 | 10,950,780 | 219,509,774 | 180,285,277 |
| Kaiser Steel Corp. | 9,121,284 | 10,399,306 | 134,500,041 | 117,925,049 |
| Colorado Fuel & Iron Corp. | 8,031,224 | 5,761,965 | 248,835,574 | 195,757,164 |
| Allegheny Ludlum Steel Corp. | 7,791,787 | 5,940,324 | 247,091,546 | 190,060,165 |
| Sharon Steel Corp. | 6,709,625 | 5,120,414 | 168,268,508 | 132,376,426 |
| Granite City Steel Co. | 6,488,452 | 4,985,954 | 87,856,006 | 74,587,639 |
| McLouth Steel Corp. | 5,241,501 | 4,227,854 | unavailable | unavailable |
| Detroit Steel Corp. | 5,230,759 | 4,276,666 | 93,391,509 | 87,421,483 |
| Crucible Steel Co. of America | 5,109,802 | 5,394,520 | 232,276,000 | 180,266,000 |
| Pittsburgh Steel Co. | 4,648,195 | 5,150,034 | 141,471,302 | 130,158,219 |
| Keystone Steel & Wire Co. | 4,149,946 | 4,073,232 | 44,554,153 | 48,939,590 |
| Lukens Steel Co. | 3,607,713 | 2,316,791 | 97,850,937 | 69,616,358 |
| Carpenter Steel Co. | 3,231,685 | 2,863,432 | 53,936,056 | 47,680,029 |
| Alan Wood Steel Co. | 3,213,690 | 2,251,073 | 59,756,645 | 60,479,849 |
| Newport Steel Corp. | 3,205,698 | 1,903,209 | 63,989,993 | 50,502,854 |
| Copperweld Steel Co. | 2,852,078 | 2,304,387 | 83,803,418 | 71,642,488 |
| Laclede Steel Co. | 2,703,805 | 2,132,746 | 50,834,319 | 47,545,026 |
| Barium Steel Corp. | 2,321,140 | 2,746,050 | 89,719,175 | 99,052,028 |
| Rotary Electric Steel Co. | 2,262,367 | 1,843,064 | 44,150,335 | 37,212,183 |
| Continental Steel Corp. | 1,603,163 | 1,477,030 | 36,761,804 | 35,716,970 |
| Midvale Co. | 1,357,781 | 1,188,899 | 30,255,784 | 30,039,172 |
| Vanadium-Alloys Steel Co. | 1,096,434 | 1,252,686 | 15,649,717 | 17,284,383 |
| Northwestern Steel & Wire Co. | 303,163 | 1,830,601 | 44,317,283 | 34,049,969 |
| | $695,476,319 | $504,303,965 | $12,354,025,128 | $10,156,252,662 |

*Before special charge of $6,309,753 arising from loss on disposal of Wheaton mine.

**A few companies had record earnings last year, but the industry profit totals are below 1950, the all-time high. Earnings in 1953 were 5.6 cents per sales dollar**

STEEL industry sales set a new record in 1953 of $13,350,000,000, a STEEL survey shows.

Net profit, however, did not set a record. It was held down by the federal excess profits tax, and as a result was $745 million, second best in history. The record was $766.9 million in 1950, when federal income tax rates were much lower than they were in 1953. However, some companies had greater net earnings in 1953 than in 1950.

Net earnings in 1953 rose over those of 1952 by 38 per cent while sales climbed 21.6 per cent. As a result, net earnings per dollar of sales moved up to 5.6 cents in 1953 from 4.9 cents in 1952.

Those sales and earnings figures for the entire industry are based on the performance of 30 companies which have 92.6 per cent of the steel industry's ingot capacity. Sales and net earnings for those companies are shown in the accompanying table. Many additional details about their 1953 operations, along with comparisons with 1952, will be presented in STEEL's 29th Annual Financial Analysis of the Steel Industry in the Apr. 12 issue.

## DuPont Cuts Titanium Price

Price reductions for ductile titanium metal sponge, the first reduction in the price of this form since it was introduced in 1948, were announced by E. I. duPont de Nemours & Co. Inc.

New prices are $4.72 a pound for grade A-1 containing a maximum of 0.3 per cent iron and $4.46 a pound for grade A-2 which has a top iron content of 0.5 per cent.

By E. C. KREUTZBERG Washington Editor

# U.S. Seeks Industry's Know-How To Help Sell America Abroad

WANT TO GIVE Uncle Sam practical and immediate help?

And the kind of aid needed—selling—is right up industry's alley, too. The U. S. Information Agency is asking business to carry a larger share of the burden of selling the United States to the rest of the world.

There are a number of sound reasons for mobilizing industry in this chore. Most companies, and their trade associations, possess information and public relations "know-how," have employees, representatives or correspondents overseas, and stand to better their own overseas business by building up friendship for and confidence in the United States.

## How It Works . . .

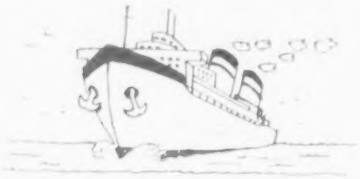
How does this co-operation work? A good example is the help USIA got in distributing the significant speech of Dec. 8 in which President Eisenhower proposed an international pool to outlaw military use of atomic energy and develop this new force to peacetime uses to improve the living plane of mankind throughout the world. A total of 262 firms distributed more than 300,000 copies, in 10 languages, of the speech highlights. Most of them were accompanied by covering letters emphasizing the significance of the President's thoughts. Since the great bulk of this exchange was between people here and overseas who know each other personally and in most cases have business relationships, the effect was impressive.

## 858 Are Co-operating . . .

Working without fanfare, USIA's Office of Private Co-operation has lined up 858 firms and groups for arrangements of one type or another. Some 60 companies now get their employees to turn in old magazines as they finish reading them. As these collect, they are mailed to

employes and business connections overseas. USIA wants to enroll many more companies and organizations in this activity since foreigners reading our popular magazines will develop a better understanding of the American way of life and of American ideals.

Jobs done by individual companies cover a wide range. U. S. Steel Corp. donated, and the agency sent to some 125 countries, many thousands of "Steel Serves the Nation," and "Steelmaking in America." It also sent all over the world U. S. Steel's documentary film, "Steel", and this has been exhibited with beneficial results. Wide use is being made of a Radio Corp. of America booklet prepared for RCA employes going overseas; it is entitled "So You're Going to Work Abroad for RCA." It tells these people not only what personal effects to take along, but also how they should conduct themselves to win the friendship of the people with whom they will work overseas. Extensive use is being made of a Westinghouse Electric Corp. booklet entitled "What Should I Know When I Travel Abroad?" All tourists leaving the United States are given a copy of this booklet. It instructs them on problems of money exchange, hotel accommodations, dress, tipping, the best way of seeing the sights, how to proceed when you get sick or lost, what to eat and drink—above all—how to behave so as not to appear a boor to people in the countries that are visited.



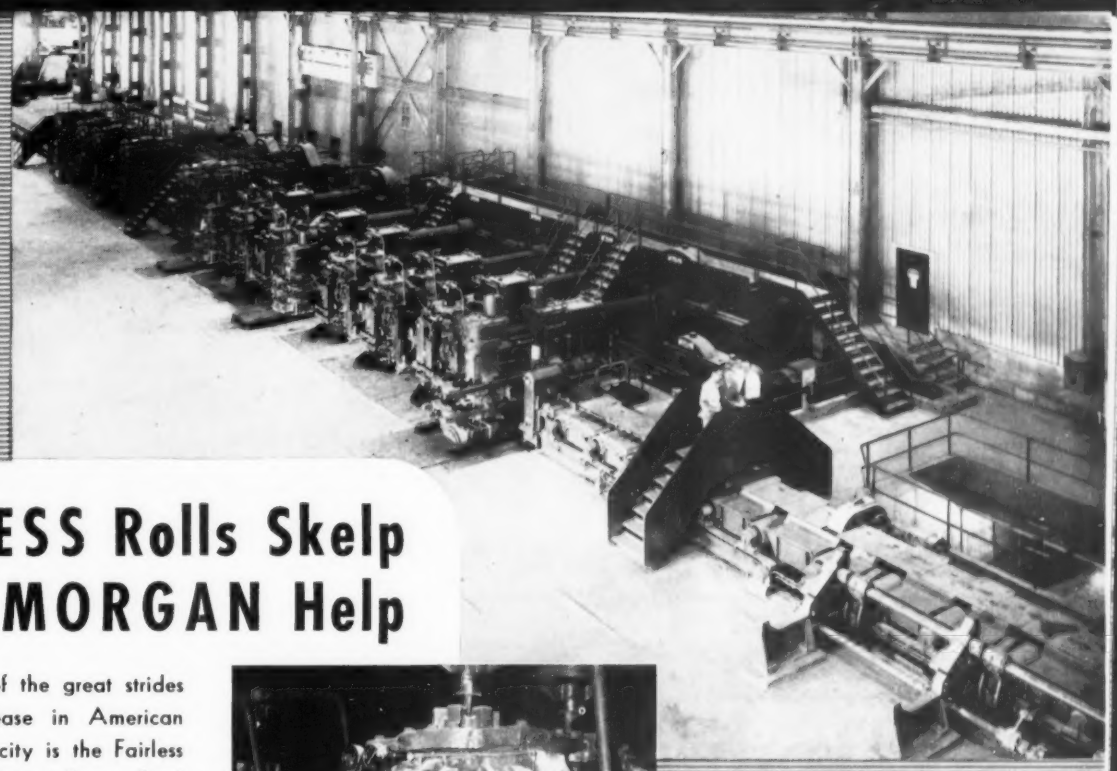
There are many special jobs. For example, the agency recently sponsored an Atomic Industrial Forum participated in by leading commercial firms active in developing atomic energy for peaceful purposes. The forum conducted a news seminar for foreign correspondents in the United States to outline progress being made in this field. Many articles were written as a result, so that people abroad obtained an informed impression of what the President's pool proposal was all about.

## Important Intangibles . . .

Working with a leading advertising agency, the USIA has attempted to stimulate the development of a program of institutional advertising abroad by American firms to explain the advantages of American free enterprise and United States foreign policy objectives.

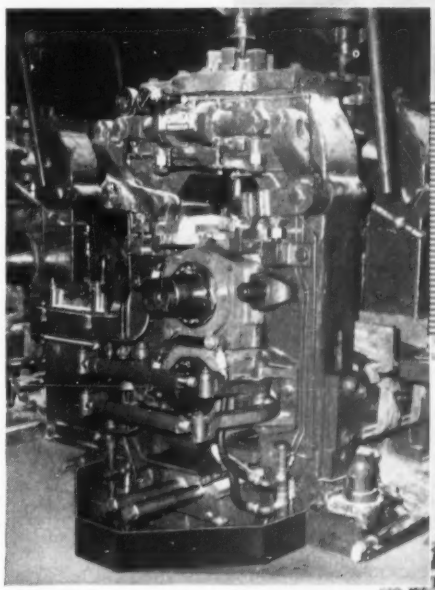
Not the least factor in this program of co-operative effort with industry is the fact that by getting American business solidly behind the campaign it will be much more far-reaching and effective in its results than would ever be possible through government action alone and the spending of government funds.

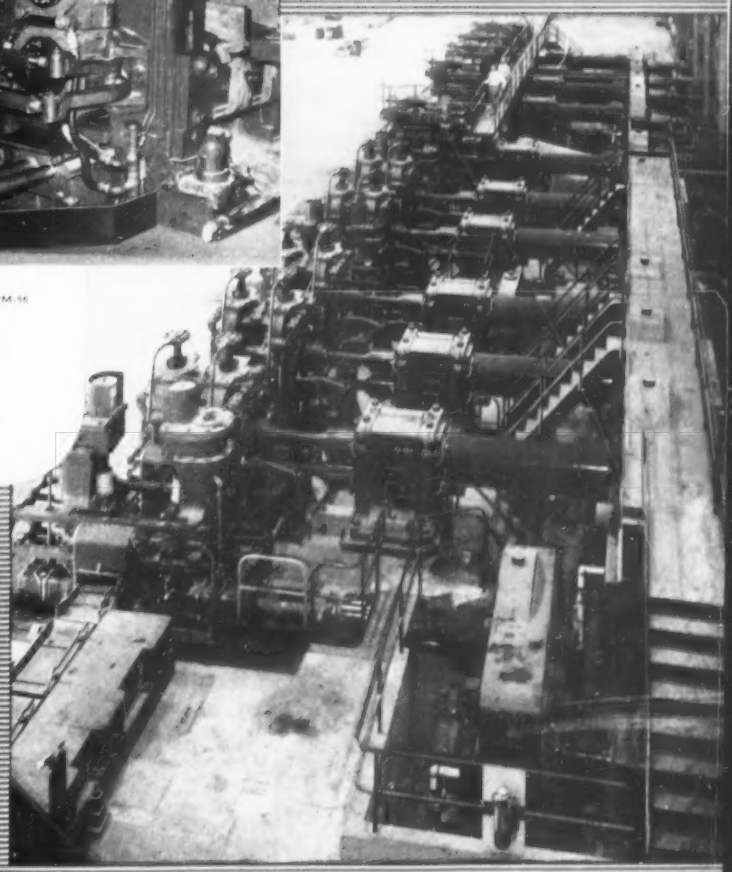
If your company can help in this work and has not yet been approached, contact USIA's Office of Private Co-operation in Washington, Chicago, New York or San Francisco.



# FAIRLESS Rolls Skelp with MORGAN Help

Hailed as one of the great strides toward the increase in American steelmaking capacity is the Fairless Works of the United States Steel Corporation at Morrisville, Pa. National Tube Division's 18" Skelp Mill, a vital part of this enterprise, was designed and built by Morgan Construction Company. Product gauge is assured by rigid closed top roll housings and MORGOIL roll neck bearings. Four ton slabs of steel become four ton coils of high quality skelp. For these, Morgan handling equipment meets exacting requirements for the safety and comfort of the mill operators with no loss of efficiency.





RM-56

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**WORCESTER, MASSACHUSETTS**

*English Rep.*, International Construction Co., 56 Kingsway, London W. C. 2, Eng.

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ANOTHER REASON WHY YOU
GET MORE FOR YOUR MONEY WITH CLARK . . .

**1 Hydraulic service brakes on the drive wheels:** by incorporating the internal expanding double-shoe design with large braking surface, positive control of the truck at all times is assured for even the severest service requirement.

**2 "Dead-man" brake on the armature shaft:** this positive acting brake takes hold automatically the instant that the driver leaves the truck—disconnects the power, returns all controls to neutral, assures that the truck will *remain* stationary.

**3 Dynamic braking by reversing current through the drive motor:** this braking method permits smooth deceleration, with no grabbing; but positive automatic control eliminates all danger of damage to electrical motors and controls.

This three-way braking system is another exclusive feature of Clark electric fork trucks—the safest electric trucks on the market. It's another good reason for talking to your local CLARK dealer (see the Yellow Pages of your phone book) when you're in the market for electric fork trucks.

And remember: Only Clark has no axe to grind for any particular type of truck. We produce them all: gas, electric, diesel and L.P.G. fork trucks; POWRWORKER hand trucks; ROSS Carriers. For unbiased experienced counsel, see your Clark dealer today.

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Industrial Truck Division
**CLARK EQUIPMENT COMPANY**
BATTLE CREEK 26, MICHIGAN

PART 2

# Renting . . .

## Pitfalls To Avoid

EQUIPMENT leasing is something like seasoning in a meal—too much or the wrong kind can be disastrous.

While leasing's advantages are numerous (STEEL, Mar. 29, p. 67), the disadvantages are also strong. Proof lies in the fact that probably less than 5 per cent of all nongovernment equipment is now leased and that the total never will match that of equipment sold outright.

**Lessor's Problems**—If you're a lessor or a potential lessor, your biggest headache is capital. What leasing does is to shift from the user to the builder the responsibility for finding capital. Signode Steel Strapping Co., Chicago, has been leasing since the 1920's. Today it has equipment in customers' plants that originally cost $6 million and has a depreciated value of about $3 million. "Capital is one of the basic considerations," says Joseph Pois, vice president and treasurer.

That kind of equipment makes good collateral for a company like Signode, long established in that type of operation. But banks and other lending institutions are decidedly conservative about lending money on these deals when a company is just embarking on a career as a lessor. That's because it takes time to make money on leases. Sell a machine and you make your full profit at once or within the relatively short period of your financing arrangements. Lease a machine, and you don't make your full profit until the lease is up. You have to lease for several years before you bring your profit up to the level that it would have been had you made outright sales of the same machines.

**Paperwork**—The red tape of leasing is also more involved than in selling. As lessor, you must collect the monthly rent, take care of insurance, carry the equipment on your books, depreciate it for tax purposes. "There's no doubt that the load of office work is more onerous when you lease than when you sell," says Signode's president, John H. Leslie.

WIDESPREAD INTEREST in leasing is developing because it's one way to finance modernization. Modernization is a necessity in these competitive times. STEEL last week outlined the advantages of this marketing device. Here are pointed out some of the pitfalls. Next week will appear pointers on how to set up a leasing program.

**Equipment Return**—Many companies thinking about leasing are particularly worried about what they would do if they were suddenly deluged with returned equipment. Signode has not been troubled by this. Because it has 40,000 customers, the danger is remote that a substantial portion would return equipment at the same time. The more equipment you have out, the less the danger. A company just starting to lease is more vulnerable.

**Obsolescence** — Another disadvantage to the lessor is that he may become subject to legal or public opinion attacks that he is deliberately holding back on equipment improvements to protect the machinery he has out. This argument doesn't hold water because the overwhelming majority of lessors also sell. If they made no improvements in their products, their sales would drop. The relatively few companies who lease but never sell must make product developments since their competition would get ahead of them if they didn't.

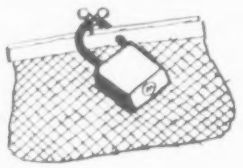
**Depreciation**—Another problem for the lessor is to get his rate of depreciation write-offs for tax purposes in approximate balance with rental income. If the two are unbalanced, you lose tax credits and complicate your accounting. Douglas C. Leffingwell, a Cleveland certified public accountant, has made a specialty of this problem. In the case of a company manufacturing commercial air-conditioning units, he set up a subsidiary that could adopt a new depreciation schedule more nearly conforming to the rental income. The Internal Revenue Service is tough about allowing a company to change its established depreciation schedule—hence the need for a new company with no old schedule. A subsidiary, incidentally, to handle all leas-

ing for a company that also sells, can simplify other accounting and organizational problems, too. Yale & Towne Mfg. Corp. formed a subsidiary, MHE Corp., to handle its leasing.

**Servicing**—A final objection to leasing for the equipment builder is the servicing and maintenance headache. Even if the contract doesn't call for you to do the job (but many do), it's to your interest to keep your equipment in shape. That means a larger service and maintenance crew than if you sold.

**Problems of the Lessee** — The greatest disadvantage in leasing from the user's standpoint is also probably the one that could be most easily remedied. Conflicting court decisions and the lack of a clear policy statement from the Internal Revenue Service makes it difficult to know when a lease with an option-to-purchase clause is a bonafide lease or just a conditional sale. The distinction is important. Under a conditional sale, the rental payments would not be tax deductible. The tax advantage would be lost.

Generally, you're in the clear if the leasing contract contains no option-to-purchase clause and if the rents are not outrageously high. But many lessees insist on an option to purchase. Many companies—Warner & Swasey Co. and Kearney & Trecker Corp. are examples—have a plan providing for an option to purchase, but they clearly warn the customer of the pitfalls.



Lenders: Cautious about leasing

**Relief Coming**—To clarify the situation, IRS should come out with some policy that would solve the problem for 80 or 90 per cent of the cases, with the remaining 10 or 20 per cent dealt with through a preclearance procedure. IRS already has a limited preclearance setup in the office of the assistant commissioner, Norman A. Sugarman. He says IRS realizes the need for clarification and "is examining areas of continuing controversy to determine the means by which greater certainty can be obtained in the application of the tax laws." From IRS come cautious predictions that clarification of the issue will come "by summer—maybe."

What would be an acceptable clarification? The crux of that problem is the concept of fair value. What is the fair value of a five-year-old machine tool or lift truck? For automobiles or real estate, the figure can be determined fairly closely because of their active used markets. Not so for capital equipment. So, some substitute way of determining the fair value must be found. The best one seems to be the rate of depreciation. You know the original cost; subtract the depreciation; then you have fair value. IRS then says you decide the ques-

## WHY LEASE?

# The Disadvantages

**TO THE BUILDER** (Lessor)

- It requires more capital than if you sell.
- It forces you to wait longer for your profit than if you sell.
- It involves more red tape than selling.
- It presents the possibility of loading you with a deluge of returned equipment.
- It means unusual accounting problems.
- It can give you the responsibility of service and maintenance.

**TO THE USER** (Lessee)

- It leaves you in an ambiguous tax situation because the Internal Revenue Service has not clarified its definition of when a lease is a lease or just a conditional sale.
- It withholds from you the prerogatives of ownership.

**TO BOTH BUILDER AND USER**

- It puts you on the legal defensive; because of a few past dubious deals, the courts and Internal Revenue Service scrutinize most leasing arrangements with particular care even though 99 of 100 today are perfectly legitimate.
- It puts you on the moral defensive; because of a few dubious deals in the past and because of a widespread bias toward ownership, leasing is sometimes considered morally or socially wrong.

tion of conditional sale or lease this way: If the lessee exercising his option to purchase pays close to the fair value, then the lease was a lease and the paid rents are fully deductible; if the lessee pays nowhere near the fair value, then the transaction was nothing more than a conditional sale.

**Reasonable?**—So it seems, but there's a joker. It all hinges on the rate of depreciation. Industry claims that IRS' rates are too low, wholly unrealistic. Therefore, the fair values claimed by IRS, especially in the early years of equipment's life, are usually much too high.

A solution to the impasse may come from Congress. Already approved by the House and considered a shoo-in in the Senate is a measure that would permit a double-rate declining balance method of figuring depreciation. Under this schedule about two-thirds of the equipment's useful

Lessors' big headache: Capital

life would be written off in the first half—which is about the way equipment actually wears out.

Some experts believe that an acceptable clarification would result if IRS stipulates that a lease is a lease under these conditions: 1. Rental charges parallel actual depreciation within 10 percentage points; 2. fair value is figured and paid, in the case of the purchase option, on the basis of the double-rate declining balance method of calculating depreciation. That wouldn't solve all cases, but it would 90 per cent of them. A pre-clearance procedure could rule on the remaining peculiar ones.

**You Don't Own**—Even if the tax ambiguity matter is resolved, a major disadvantage remains in leasing for the lessee. When you rent something, you can't do with it what you could if you owned it. Want to move the machine to another plant? Want to use it for

Maintenance: Another problem

three-shift instead of two-shift operations? Want to modify the device because of an unexpected engineering change in your product? If you lease, you'll need an O.K. in most cases from the lessor.

From a few past abuses of leasing, particularly in dubious tax deals, the practice of leasing has a slightly tarnished reputation. As a potential lessor or lessee you will have to be particularly careful that your contract is clean. Leases get especially close attention in the courts and from IRS, even though today 99 and 44/100 per cent of them are pure.

**Psychological** — Still another psychological factor works against leasing. There's a bias for ownership. Even if you can prove mathematically that it's more advantageous to lease, sometimes the customer can't be convinced.

Not everyone should lease, but everyone in the market for new capital equipment should consider leasing, if the machinery you need

Instinctive: To own, not to lease

is handled that way. Leasing is a legitimate marketing device. If wisely used it can add a richer flavor to your profits, as good seasoning can add flavor to your meal.

## Easier Metal Controls

**The Defense Materials System is simplified to eliminate 90 per cent of the paperwork**

SOME 90 per cent of the paperwork required by the Defense Materials System was eliminated Apr. 1 when Business & Defense Services Administration's revised system went into effect.

Six months in preparation, the modified plan provides that only prime contractors and principal suppliers hereafter will have to report on procurement, receipts, shipments and inventory of controlled materials.

**Streamlined**—That means that 90 per cent or more of consumers are relieved of reporting. The revised system retains the framework of a control program which may be used as a springboard in case of total mobilization.

Here's an example of what the shift means: Only six contractors of a total 268 suppliers remain under allotment control in a Navy plane job (typical of the contractual setups for many other military end-items). Under the old system, all 268 were under allotment control. The simplified system calls for just the prime contractor and his five principal suppliers to report. The other 262 suppliers on their purchase orders use a rating supplied by the prime contractor and need not report.

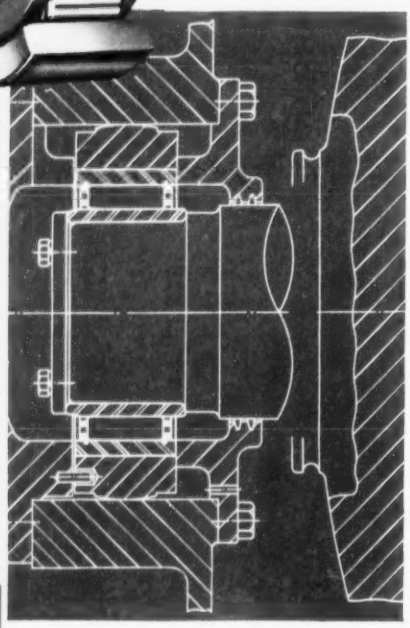
**More Self-Authorization** — The most important change in DMS' revised Reg. 1 is an expansion in the use of self-authorization to include a segment of Class A products. The old Reg. 1 allowed self-authorization, but for Class B or off-the-shelf items only. Now, Class B goods may be still self-authorized, plus some small Class A items using a relatively small quantity of metal. Anybody in the supplying chain for a military end-item may place rated orders for limited quanities of small Class A products without authorizing production schedules and making allotments.

DMS Reg. 2 has been amended to effect the same simplification in allotting materials and products used in construction and parallels Reg. 1 for military end-items.

# HERE'S HOW HYATTS HELP...

## Is shaft expansion a problem?

Hyatt Hy-Loads are available in separable outer race, separable inner race or non-separable construction.



Check the drawing at the left. The bearing is a Hyatt Hy-Load, and because the inner race is cylindrical, the shaft it supports is free to move axially—thus allowing for shaft expansion without cramping the bearing or distorting the shaft. Obviously, this is only one of many ways in which Hyatt bearings can be used to reduce costs as they reduce friction, but it's a good example of why so many designers throughout industry keep their Hyatt catalogs within easy reach.

For further details write for Catalog 150 or call your nearest Hyatt representative.

# HYATT

## ROLLER BEARINGS

STRAIGHT BARREL TAPER

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

Variety on the assembly line demonstrates that . . .

# Kaiser-Willys Marriage Working; Toledo Integration Job Is Unique

*DETROIT*

AS KAISER AND WILLYS head toward their first anniversary the end of this month, it's obvious there's more to auto company marriages than a sweet exchange of debentures.

**Integration**—In the case of Kaiser and Willys, it's integration of functions and facilities to eliminate duplication and lower unit overhead. Without such co-ordination and consolidation much of the basic purpose of the move would be lost. But if you knew the Willys plant before Kaiser production was shifted there from Willow Run, you may be wondering how you could get Kaisers into final assembly even on end, let alone as part of the regular production set-up.

To some, Willow Run seemed the logical place for consolidation to take place. A veritable indoor airport, this facility is as flexible as all outdoors. But Edgar F. Kaiser explains that the Willow Run plant also was the most saleable and that one plant had to be sold. Overhead was lower at Toledo, and it was felt that less community and employee hardship would be worked by consolidation in Toledo than at Willow Run. Further, the Willys plant was already a strong part of the Toledo scene, meaning that the organization would have greater identity.

**Despite Obstacles**—On this basis the decision was made to move to Toledo. Actual discussion at the jig and fixture level began on Oct. 6 and the first Kaiser rolled down the revamped line on Feb. 1. The fact that the move could be accomplished in this time is enough, but that it was achieved under conditions to be described below rank it as a tribute to production ingenuity.

To begin with, the production of Willys' "commercial mix," i.e. trucks, station wagons and utility vehicles, was maintained on the line during the changeover. That meant much of the work had to be done at night and on week ends. But when a final assembly line stops, it can't be moved for there are partially completed vehicles on it with no place to go. Further, the vehicles prohibit work on the segment of the line they occupy, and the return segment of the conveyor at Willys is inaccessible. That meant that only the empty segment waiting to receive a chassis could be changed each night, and as more and more segments were changed the probability of an unchanged segment stopping in the empty position diminished.

**Mixture as Before**—The fixtures installed on the line, incidentally, are so designed that they will accommodate the Willys which has no separate chassis, the Kaiser which has a chassis and a much longer wheelbase, the Henry J which has a chassis and short wheelbase and the whole assortment of commercial vehicles which were being produced while the change was being made. The same is true of the engine dress-up fixtures as well, with the Willys four and six and the Kaiser six all fitting into the same fixture by means of noninterfering contact pads.

That all adds up to a line as flexible as a school girl's girdle, but it also creates an additional problem. When you have several types of vehicles going down the same line, you must maintain parts supplies for all of them. Doubling the types of vehicles just about doubles the parts requirements and consequently space requirements. The problem was that the Willys final assembly line already was no place to hold a barn dance.

**Solutions**—Part of the solution came through shifting the hardware to body trim and getting inventories of door handles, chrome trim, etc., out of the final assembly area as much as possible. A second element comes through extensive subassembly before the final assembly point is reached. The Kaiser supercharged engine,

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for example, arrives complete from Detroit with the blower bracket in place with only the unit itself inventoried on the line.

Even so, space limitations still decree that a couple of hours inventory is all that can be carried of larger parts like steering wheels, steering columns, etc. Parts are stored all over the plant, and stock chasers are worth their weight in gold. And yet the final assembly gives an impression of close knit efficiency rather than claustrophobic chaos.

**Complications Compounded** — There were other complications in the changeover, such as the fact that models were changed at the same time the line was changed and the fact that Willys had no paint facilities large enough to handle parts like the Kaiser hoods and fenders and facilities had to be installed.

But here's the clincher. Before the changeover, production of the line was rated at 22 vehicles per hour. Now, even with the increased variety of vehicles, capacity of 25 units an hour is possible, and they can be run through in any combination—Kaisers, Willys, Henry J's or commercial vehicles or any individual type exclusively. And the production integration program is only well begun.

**More Changes Coming**—Most recent step was the change of all commercial vehicles to one of two final assembly lines absorbing capacity idled by military cuts in jeep orders. That took place Apr. 1, and as things stand now passenger cars are coming down the other final assembly line, further aiding in the parts inventory space problem. But changes which may prove just as important costwise are still ahead.

At present Murray Body builds the Willys body shell in Detroit, while the Kaiser bodies are built at Willow Run. Both are trucked to Toledo, a distance of some 40 miles, where they are painted and start down the line. By July 1, the heavy stamping operations of Kaiser Motors will be moved from Willow Run into a 22,000-square-foot expansion at Shadyside, O., and facilities will be ready to handle body assembly at the Toledo plant. When that happens, the bodies will move out of build-up, into paint and onto the line in the most approved cost-cutting fashion.

Undoubtedly other improvements will be coming along, but as their first anniversary approaches the Kaiser-Willys family can look with pride on the way they have set up housekeeping.

## Auto, Truck Output

U. S. and Canada

| | 1954 | 1953 |
|---|---|---|
| January | 594,789 | 614,000 |
| February | 573,821 | 628,017 |
| March | | 752,474 |
| April | | 782,453 |
| May | | 685,390 |
| June | | 713,206 |
| July | | 757,595 |
| August | | 641,152 |
| September | | 605,228 |
| October | | 651,153 |
| November | | 457,852 |
| December | | 529,588 |
| Total | | 7,818,108 |

| Week Ended | 1954 | 1953 |
|---|---|---|
| Feb. 27 | 145,980 | 167,779 |
| Mar. 6 | 139,263 | 158,825 |
| Mar. 13 | 143,478 | 165,762 |
| Mar. 20 | 154,895 | 169,923 |
| Mar. 27 | 149,893 | 181,749 |
| Apr. 3 | 152,000* | 170,567 |

Source: Ward's Automotive Reports.
*Estimated by STEEL.

## Exhaust Notes

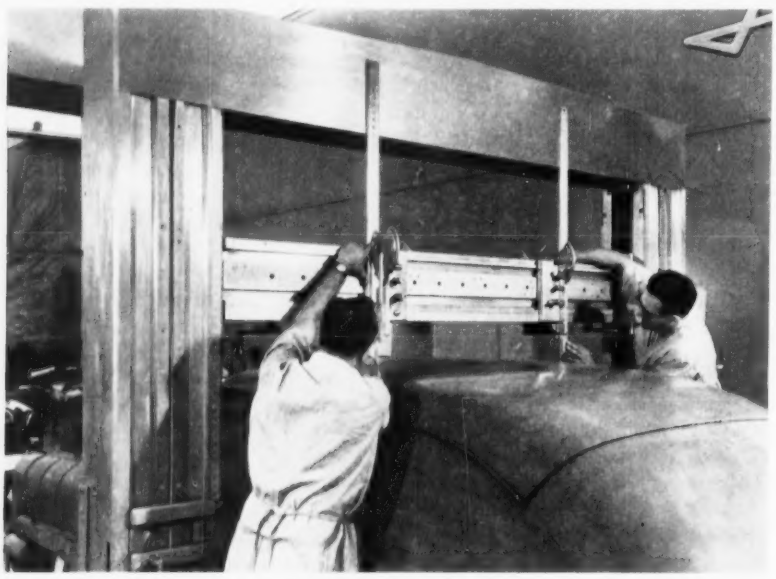
Probably you've noticed that the reports say the Ford Thunderbird uses "parts interchangeable with other advanced and future Ford models." A check with a friend at the House Henry Built reveals that this is literally true. The Thunderbird will use steel panels from the Ford line of 1955, and that's why production will be starting in September.

Better take another look at that one, it's the Ford in the Future, deluxe convertible version.

Incidentally, the Lincoln Premier, a plastic-panel-top job similar to the Skyliner and Sun Valley, but a little more on the landau side, is being tooled for production. There are also reports that tooling will be ordered shortly for the futuristic XM-800.

Hudson, getting into the swing of things, now has 25 Italia bodies in Detroit and will shortly lower them onto Jet chassis with an option of Jet or Hornet engines. Expected cost of these nifties about $6000; probable initial production about 100 units.

Buick has added a convertible to the Century Line, something you'll want to avoid at stop lights.

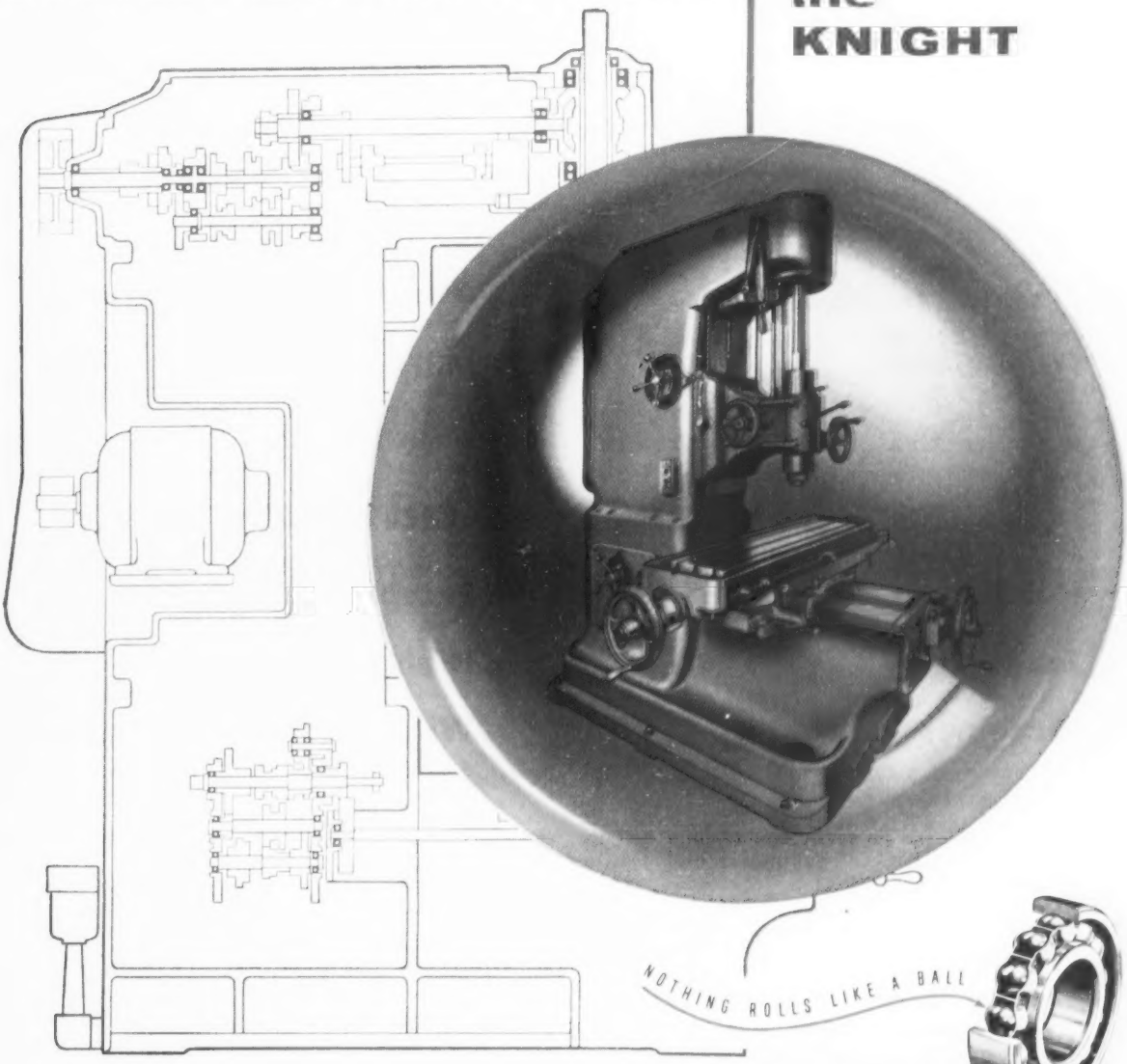


**Giant Caliper Aids Ford Modelmakers**

King-size caliper developed by Ford Motor Co. is accurate to 1/10,000-in. Made of tempered aluminum, it provides a means for transferring exact design dimensions from blueprints to full-scale models. The modeling bridge gives more precise measurements and is easier to handle than its predecessors, says Ford

# NEW DEPARTURES AT WORK

## all through the KNIGHT




Combining great capacity with exceptional accuracy, W. B. Knight's No. 50 is a versatile milling and boring machine. New Departure **ball** bearing applications are found literally throughout the Knight. They assure rigid support of moving parts . . . maintain accurate pitch-line contact of gears . . . give longer life with minimum maintenance.

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| | | | | | |
|---|---|---|---|---|---|
| **BRISTOL** | 269 North Main St. | 2-6371 | **DETROIT** 7-122 General Motors Bldg. | Trinity 2-4700 | **KANSAS CITY** 1021 E. Linwood Blvd. | Valentine 4939 |
| **BOSTON** | 517-A Park Square Bldg. | Hancock 6-9867 | **CINCINNATI** 2107 Carew Tower | Main 5783 | **MILWAUKEE** 647 W. Virginia St., | Broadway 6-9460 |
| **KANNAPOLIS, N. C.** | P. O. Box 1086 | 2-3181 | **CLEVELAND** 3113 W. 110th St. | Winston 1-5454 | **ST. LOUIS** 3001 Washington Blvd. | Franklin 6533 |
| **NEW YORK** | 1775 Broadway | Circle 6-1540 | **INDIANAPOLIS** 1357 W. 18th St. | Imperial 4680 | **LOS ANGELES** 5035 Gifford Ave. | Logan 8-2301 |
| **PHILADELPHIA** | 850 E. Luzerne St. | Garfield 3-4136 | **PITTSBURGH** Cathedral Mansions | Mayflower 1-8100 | **BERKELEY** 1716 Fourth St. | Landscape 6-8750 |
| **SYRACUSE** | 2360 James St. | 73-5195 | **CHICAGO** 332 So. Mich. Ave. | Wabash 2-5875 | **SEATTLE** 5000 First Ave., S. | Lander 5920 |
| | | | **DAVENPORT** 2212 E. 12th St. | Davenport 7-7522 | | |

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2. Lathe centers
3. Slitting rolls and knives
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5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Ball bearings
11. Asbestos disintegrators
12. Mill rolls

# ...and get all these advantages:

1. Hard
2. Tough
3. Machines easily
4. Exceptional wear-resistance
5. High tensile strength
6. Withstands working pressure of 200,000 p.s.i.

BECAUSE it's an alloy steel of high carbon analysis, Timken® 52100 has high tensile and fatigue strength. It's fully spheroidized structure makes machining easier. It has high hardenability throughout its cross section and can be oil quenched to a maximum hardness of 65/66 Rockwell C.

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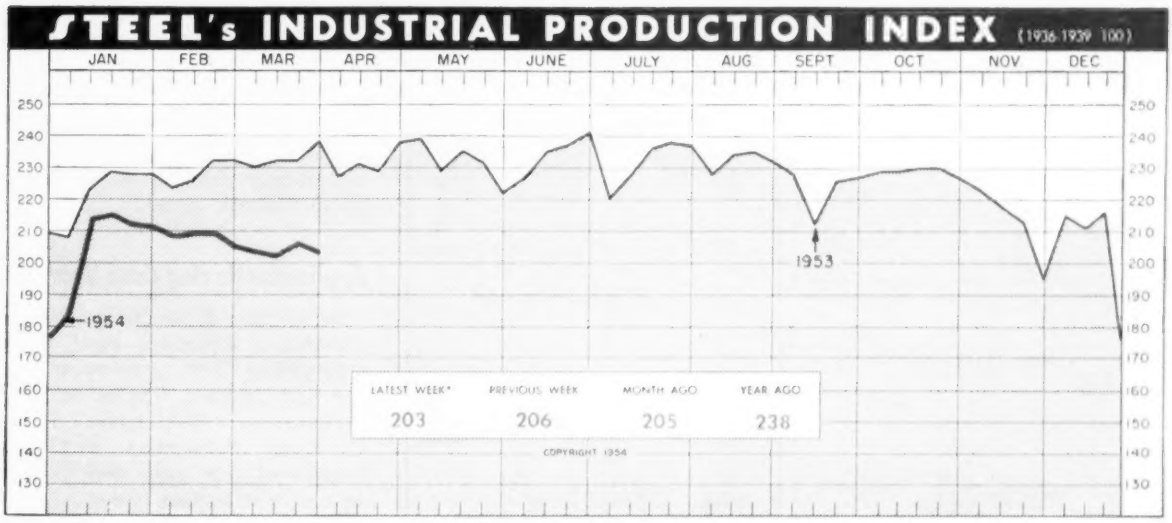
For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING




*Week ended Mar. 27

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

# Business Barometers Indicate Leveling-off

MARCH IS OVER, and there still is no definite sign of the upturn widely predicted for it. Some indicators on the business control panel point to an end of the downtrend, but they are not strong enough to suggest a swing upward. A leveling-off appears the more likely.

In its March survey of business conditions, the National Association of Purchasing Agents found that to be true. It's encouraging that for the first time since last May, purchasing executives' reports showed that industrial production and order increases both outbalanced decreases. This change was marginal for the month, and individual changes were not large.

The tenor of the NAPA report, however, was optimistic. For instance, 68 per cent of the purchasing agents reported employment holding steady, which is the same as for February. A few reported increases. Most of them expect second-quarter activity to exceed that of the first. The survey further showed that adjustments of unworked materials to current requirements have been completed by many companies. Combine that with the fact that many firms reported a rise in productivity and you get an idea of what could lie ahead in April.

## STEEL's Index Slides . . .

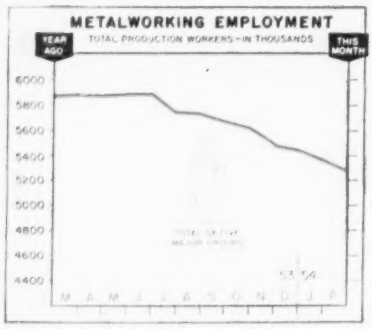
Meanwhile, STEEL's industrial production index dropped to an estimated 203 per cent of the 1936-1939 average, a decline of 3 points from the previous week's revised figure. Declines in steel production and auto output were responsible for the dip. While few persons want to go out on the limb and say so, the upturn could be coming in the former. American Iron & Steel Institute estimates production for the week ended Apr. 5 at around 68 per cent of capacity, which could represent a leveling-off in the downward trend. Several important producing areas were scheduled for slightly increased activity, but as yet there is no indication of a sustained push in the mills.

## Auto Schedules Remain High . . .

Auto and truck production in the U. S. during the week ended Mar. 27 held at high levels even though it dipped under the previous week's output by about 5000 units. *Ward's Automotive Reports* put the latest figure at 139,710. Executives in the motor industry are scheduling even higher production for second quarter in anticipation of heavy spring sales. *Ward's* says 1,521,000 units are planned for April, May and June, which would be a 7-per-cent increase over first-quarter outturn. Harlow H. Curtice, president of General Motors, told newsmen in San Francisco that he does not think the automakers are overproducing. He believes the domestic market will absorb approximately 6,300,000 passenger cars and trucks this year, a good year by any standards.

## Electricity Bounces Back . . .

Electrical energy bounced back during the week ended Mar. 20 after a slight slump the previous week. Edison Electric Institute reports 8572 million kilowatt-hours were distributed that week, which was 6.1 per cent better than in the same period a year ago. Significant in the reports is the fact that the important central industrial district continued to gain

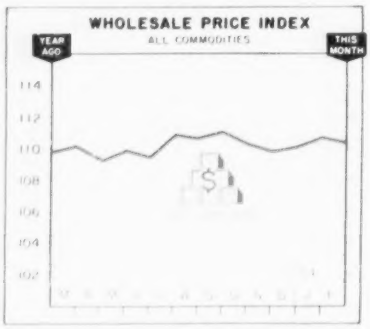



**Metalworking Employment**

In Thousands

| Production Workers—Five Major Groups | | | | | |
|---|---|---|---|---|---|
| 1953 | Prim. Mtls. | Fab. Prod. | Mach. Tools | Elec. Mchy. | Trans. Equip. |
| Feb. | 1,142 | 942 | 1,323 | 916 | 1,543 |
| Mar. | 1,145 | 952 | 1,335 | 925 | 1,574 |
| Apr. | 1,144 | 952 | 1,321 | 926 | 1,576 |
| May | 1,138 | 952 | 1,307 | 919 | 1,556 |
| June | 1,143 | 956 | 1,300 | 911 | 1,548 |
| July | 1,134 | 938 | 1,264 | 892 | 1,533 |
| Aug. | 1,131 | 950 | 1,236 | 903 | 1,523 |
| Sept. | 1,117 | 944 | 1,228 | 913 | 1,493 |
| Oct. | 1,099 | 929 | 1,219 | 905 | 1,479 |
| Nov. | 1,076 | 907 | 1,205 | 885 | 1,423 |
| Dec. | 1,061 | 879 | 1,202 | 856 | 1,460 |
| 1954 | | | | | |
| Jan. | 1,037 | 880 | 1,194 | 830 | 1,437 |
| Feb. | 1,017 | 865 | 1,192 | 814 | 1,395 |

U. S. Bureau of Labor Statistics

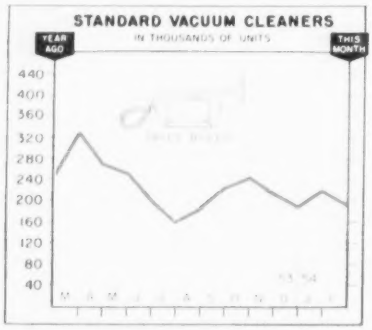



**Wholesale Price Index**

(1947-1949 = 100)

| | 1954 | 1953 | 1952 |
|---|---|---|---|
| Jan. | 110.9 | 109.9 | 113.0 |
| Feb. | 110.5 | 109.6 | 112.6 |
| Mar. | | 110.0 | 112.3 |
| Apr. | | 109.4 | 111.8 |
| May | | 109.8 | 111.6 |
| June | | 109.5 | 111.3 |
| July | | 110.9 | 111.8 |
| Aug. | | 110.6 | 112.2 |
| Sept. | | 111.0 | 111.7 |
| Oct. | | 110.2 | 111.1 |
| Nov. | | 109.8 | 110.7 |
| Dec. | | 110.1 | 109.6 |

U. S. Bureau of Labor Statistics

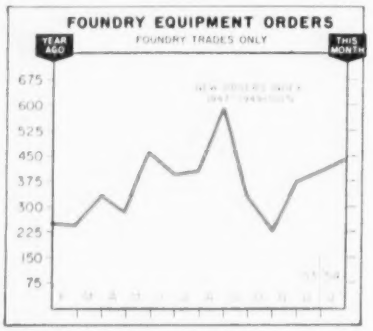



**Standard Vacuum Cleaners**

Sales Billed—Units

| | 1954 | 1953 | 1952 |
|---|---|---|---|
| Jan. | 221,233 | 235,886 | 223,357 |
| Feb. | 199,055 | 246,007 | 230,226 |
| Mar. | | 325,294 | 290,692 |
| Apr. | | 268,548 | 237,169 |
| May | | 232,404 | 216,969 |
| June | | 197,566 | 206,939 |
| July | | 159,446 | 188,715 |
| Aug. | | 188,536 | 222,413 |
| Sept. | | 227,253 | 237,541 |
| Oct. | | 249,383 | 292,474 |
| Nov. | | 216,227 | 254,297 |
| Dec. | | 190,773 | 249,032 |
| Total | | 2,781,263 | 2,841,803 |

Vacuum Cleaner Mfrs. Assn.




**Foundry Equipment Orders**

| | Index (1947-1949 = 100) | | Value Thousands | |
|---|---|---|---|---|
| | 1954 | 1953 | 1954 | 1953 |
| Jan. | 173.8 | 99.6 | $2,463 | $1,418 |
| Feb. | | 97.5 | | 1,388 |
| Mar. | | 132.2 | | 1,882 |
| Apr. | | 111.8 | | 1,592 |
| May | | 182.1 | | 2,594 |
| June | | 156.4 | | 2,227 |
| July | | 158.9 | | 2,263 |
| Aug. | | 235.5 | | 3,353 |
| Sept. | | 127.7 | | 1,818 |
| Oct. | | 87.1 | | 1,241 |
| Nov. | | 149.4 | | 2,128 |
| Dec. | | 160.8 | | 2,290 |

Foundry Equipment Mfrs. Assn.

Charts Copyright 1954 STEEL

**Issue Dates on other FACTS and FIGURES Published by STEEL**

| | | | | | |
|---|---|---|---|---|---|
| Construction | Feb. 22 | Indus. Production | Mar. 29 | Ranges, Gas | Mar. 22 |
| Durable Goods | Mar. 22 | Ironers | Feb. 15 | Refrigerators | Mar. 29 |
| Employ., Steel | Mar. 8 | Machine Tools | Mar. 8 | Steel Castings | Mar. 15 |
| Fab. Struc. Steel | Mar. 1 | Malleable Castings | Mar. 15 | Steel Forgings | Mar. 8 |
| Freight Cars | Feb. 22 | Prices, Consumer | Mar. 22 | Steel Shipments | Jan. 11 |
| Furnaces, Indus. | Feb. 8 | Pumps | Mar. 15 | Wages, Metalwk. | Mar. 1 |
| Gears | Feb. 15 | Radio, TV | Mar. 29 | Washers | Feb. 15 |
| Gray Iron Castings | Mar. 15 | Ranges, Elec. | Mar. 29 | Water Heaters | Mar. 22 |

strength for the second week in a row. For the week ended Mar. 6, this district was 3.4 per cent behind the level of the similar 1953 week. As of Mar. 20, the gap had been closed to 1.3 per cent. Also significant is the continued strength of the southeast district, which has been running consistently close to 20 per cent above year-ago levels.

## Appliances Having Good Year . . .

In the face of declining activity elsewhere, appliances have been outstanding for production in the first quarter. Typical of this performance is Westinghouse Electric Corp. Sales in the first two months of this year were 5 per cent above the like period a year ago. Furthermore, the company predicts an increase of 15 per cent for this year over the record level of 1953. That remark was predicated on the assumption that the business level remains about equal to January and February for the rest of the year.

Of special importance to the appliancemakers is the cut in excise taxes which passed Congress last week. Purchasing agents say that considerable business was held back pending the outcome of the tax bill. The cut in consumers prices which are made possible by the elimination or reduction of excises may do much to stimulate the sluggish economy. However, Sylvania Electric Products Inc. didn't wait for the outcome of the legislative debate, but went right ahead and cut prices on its television sets by $30 to $60. Other firms making similar cuts in the past have cited competition as the reason, but Sylvania didn't say.

## Easter Buying May Help . . .

Another stimulus to consumer buying this month is Easter. The retail trade has been down this year compared with 1953 and many businessmen blame the weather and the fact that Easter is two weeks later this year than last. Even at that, Dun & Bradstreet Inc. estimates that total dollar volume of retail trade in the week ended Mar. 24 was from 3 per cent below to 1 per cent

## BAROMETERS OF BUSINESS

| | LATEST PERIOD | PRIOR WEEK | YEAR AGO |
|---|---|---|---|
| **INDUSTRY** | | | |
| Steel Ingot Production (1000 net tons)[2] | 1,585 | 1,613 | 2,334 |
| Electric Power Distributed (million kwhr) | 8,491 | 8,572 | 8,075 |
| Bitum. Coal Output (daily av.—1000 tons) | 1,126 | 1,157 | 1,383 |
| Petroleum Production (daily av.—1000 bbls) | 6,455[1] | 6,461 | 6,482 |
| Construction Volume (ENR—millions) | $283.6 | $215.4 | $316.1 |
| Automobile, Truck Output (Ward's—units) | 149,893 | 154,895 | 181,689 |
| **TRADE** | | | |
| Freight Car Loadings (unit—1000 cars) | 605[1] | 610 | 715 |
| Business Failures (Dun & Bradstreet, no.) | 277 | 243 | 188 |
| Currency in Circulation (millions)[3] | $29,632 | $29,769 | $29,600 |
| Dept. Store Sales (changes from year ago)[3] | −13% | −8% | +16% |
| **FINANCE** | | | |
| Bank Clearings (Dun & Bradstreet, millions) | $20,377 | $20,232 | $18,575 |
| Federal Gross Debt (billions) | $270.5 | $274.7 | $264.7 |
| Bond Volume, NYSE (millions) | $16.8 | $16.5 | $16.2 |
| Stocks Sales, NYSE (thousands of shares) | 9,167 | 8,934 | 9,677 |
| Loans and Investments (billions)[4] | $80.8 | $79.7 | $78.0 |
| U. S. Gov't Obligations Held (billions)[4] | $32.8 | $32.3 | $31.0 |
| **PRICES** | | | |
| STEEL's Finished Steel Price Index[5] | 189.74 | 189.74 | 181.31 |
| STEEL's Nonferrous Metal Price Index[6] | 208.6 | 209.0 | 225.1 |
| All Commodities[7] | 110.8 | 110.6 | 110.0 |
| Commodities Other Than Farm & Foods[7] | 114.4 | 114.3 | 113.4 |

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

above year-ago levels, depending on the area concerned.

### Business Loans Rise . . .

Businessmen must be anticipating uptrends before the year is out, because they are investing heavily in plant and equipment. The Department of Commerce reports that business anticipates spending $27 billion this year. Other factors back up this statement. Business loans reported by member banks of the Federal Reserve System increased $458 million during the week ended Mar. 17. This was the largest weekly increase in commercial, industrial and agricultural loans ever recorded by the Federal Reserve Board. In addition, New York bankers predict a further upswing in business loans in the next three months, based on reports from diversified companies that they will require additional funds to finance rising production and sales.

### Structural Steel Holds Up . . .

Further strength of plant and equipment expenditures is indicated by the American Institute of Steel Construction. The institute reports February bookings of fabricated structural steel were 267,310 tons, the highest figure reported since May, 1953. Shipments for February stood at 251,981 tons, which meant an increase in the backlog of approximately 10,000 tons over January.

### A point of Difference . . .

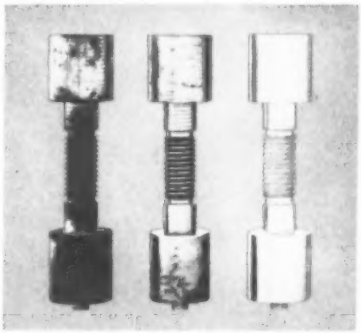
There are many similarities between the present downturn and that which occurred in 1949, but a notable difference is in prices. In 1949, consumer prices declined about 10 per cent; this year there has been no such decline. In fact, the National Industrial Conference Board reports that for January the consumers' price index rose 0.7 per cent and the purchasing power of the dollar edged down to 54.3 cents.

### Today's Smile . . .

If the business situation gets you down, you might try going to Alaska to sell air-conditioning units to Eskimos. Admiral Corp. reports that such sales in the first three months of 1954 are ahead of those at San Diego, Calif., and Jacksonville, Fla.


# NEW WAY TO STOP RUST

**Easily! Quickly! Without Slushing!**



Without VPI With VPI

## MARVELLUM

**vpi WRAP**

**Paper coated with a Volatile Corrosion Inhibitor**

Look at these steel samples—they tell the story. After 3 years of unsheltered storage outdoors in an industrial marine atmosphere, only the VPI wrapped sample on the right is still bright and clean. The untreated sample on the left was wrapped in plain kraft, the middle one treated with a good rust-preventive oil and wrapped in Grade A barrier material. All were overwrapped with kraft-asphalt paper.

A special coating on the VPI paper vaporizes . . . forms an invisible protective film that positively prevents rust.

Marvellum VPI is easy to use . . . just fold the paper over the part. No need for time-consuming slushing or greasing. No mess or costly cleaning when the item is unwrapped. It's bright and clean, ready for immediate use.

You'll find many uses for Marvellum VPI in your plant . . . wrap steel parts, protect inventories, line tote boxes.

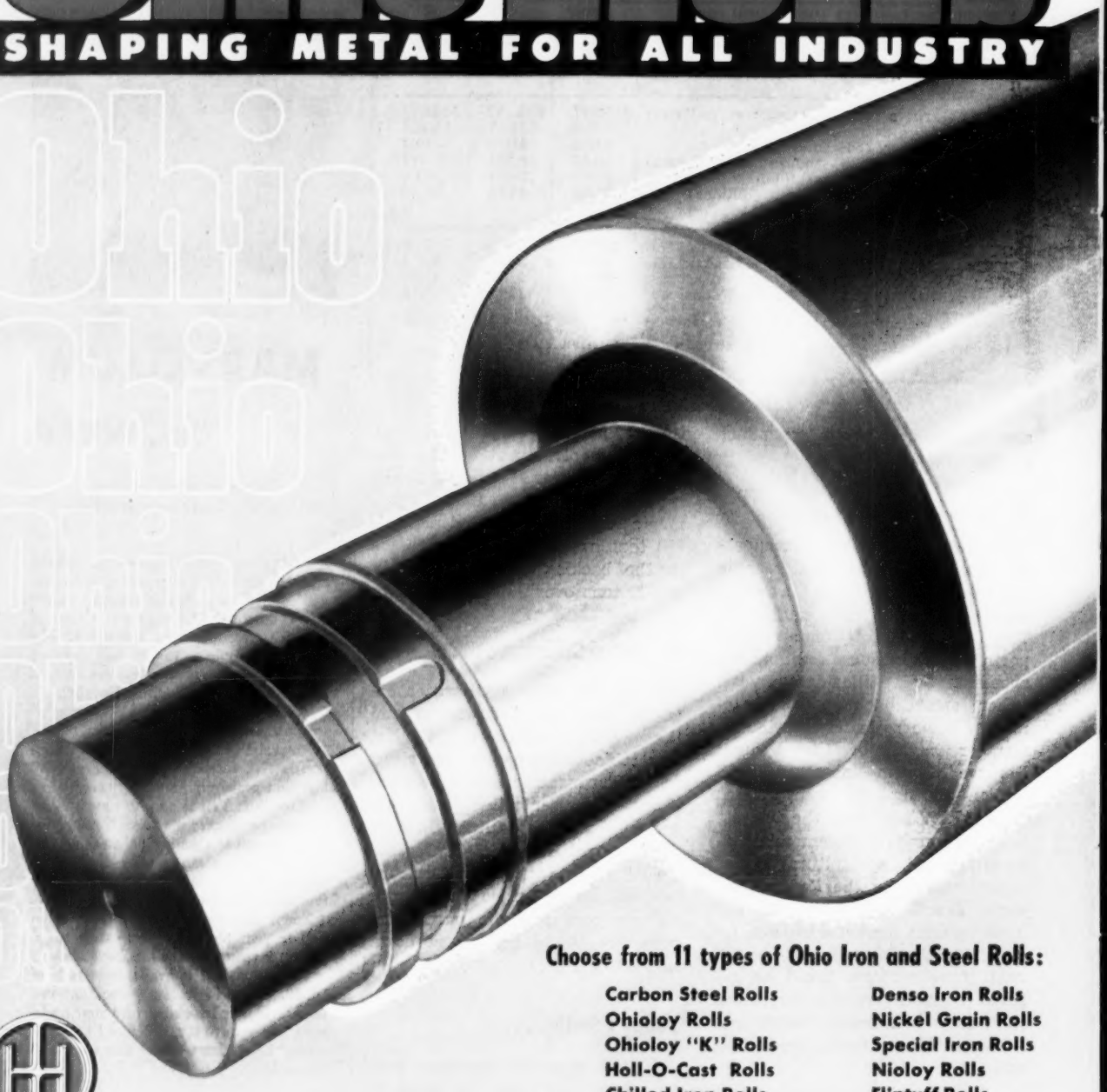
Marvellum VPI is available in rolls of 20, 30, 40 and 60 lb. paper stock and can be individually imprinted with your trademark on quantity orders. Envelopes, sheets, bags, shrouds and tubes are also available.

**FREE BOOKLET**
**Gives you all the facts.**
**Send for your copy today.**

**The Marvellum Company**
**1 Appleton Street Holyoke, Mass.**

# Ohio Rolls

**SHAPING METAL FOR ALL INDUSTRY**



**Choose from 11 types of Ohio Iron and Steel Rolls:**

| | |
|---|---|
| Carbon Steel Rolls | Denso Iron Rolls |
| Ohioloy Rolls | Nickel Grain Rolls |
| Ohioloy "K" Rolls | Special Iron Rolls |
| Holl-O-Cast Rolls | Nioloy Rolls |
| Chilled Iron Rolls | Flintuff Rolls |

Ohio Double-Pour Rolls

## THE OHIO STEEL FOUNDRY CO.

**LIMA, OHIO** — **Plants at Lima and Springfield, Ohio**

PAUL A. KARNS
. . . Crucible's Spaulding works mgr.

N. RULISON KNOX
. . . joins Husky Oil Co.

WILLIAM J. PHILLIPS
. . . Crawford Steel Foundry v. p.-gen. mgr.

**Paul A. Karns** will succeed **William D. Gross**, effective May 31, when the latter retires as works manager of **Crucible Steel Co. of America's** Spaulding Works at Harrison, N. J. Recently associated with John A. Roebling's Sons Corp. as manufacturing manager, cold-rolled products division, Mr. Karns began duties at Spaulding on Mar. 15.

**Fairbanks, Morse & Co.**, Chicago, elected **J. A. Cuneo** vice president in charge of sales. He was general sales manager. **Robert B. Craig** of the Washington staff was also elected a vice president, and **O. S. Leslie**, vice president-manufacturing, was made a director.

**Fred A. Sheridan** was appointed sales manager, **Lakey Foundry Corp.**, Muskegon, Mich. He previously served as production manager. He joined the company in 1944 after serving General Electric Co. at Ft. Wayne, Ind., for many years as a buyer of castings. He succeeds the late **George Kramer**.

**American Machine & Metals Inc.**, East Moline, Ill., appointed **R. M. Hammes** assistant general sales manager in charge of its Niagara Filters Division and its Tolhurst Centrifugals Division. Mr. Hammes joined AM&M in 1943 and in 1946 was made assistant to the general sales manager in charge of sales promotion.

**N. Rulison Knox**, former vice chairman of Bucyrus-Erie Co., joined **Husky Oil Co.**, Cody, Wyo., as vice president and a director. He also serves as president of Husky's newly acquired Gate City Steel Works Inc., Omaha, Nebr., and subsidiary of the same name in Boise, Idaho. Mr. Knox has established offices in Denver.

**W. B. Greene**, president of **Barber-Greene Co.**, Aurora, Ill., resigned that position in favor of **H. A. Barber**, former vice president. Mr. Greene becomes chairman of the board. Five new vice presidents and the operation they head include: **S. E. Faircloth**, production; **E. H. Holt**, sales; **J. D. Turner**, publicity and promotion; **E. E. Herting**, comptroller; and **R. C. Heacock**, manufacturing and engineering. Other new officers are **J. M. Spence**, treasurer; **W. A. Greene**, secretary; **Urban Hipp**, assistant treasurer and **F. J. Merrill**, assistant secretary.

**J. Kenneth Sloan** was made manager of pump sales for the Yale lock and hardware division, **Yale & Towne Mfg. Co.**, Stamford, Conn., and **Joseph E. Parsons** was made his assistant.

**David D. Davis**, director and vice president of sales, **Continental Screw Co.**, New Bedford, Mass., has resigned.

**William J. Phillips** was appointed vice president and general manager of **Crawford Steel Foundry Co.**, Bucyrus, O. For the last three years he has headed the sales organization of Crucible Steel Castings Co. and prior to that was director of product development for Steel Founders' Society of America.

**Louis T. M. Ralston** was elected to succeed **Hoyt E. Hayes** as president of **Industrial Brownhoist Corp.**, Bay City, Mich. **Max Riebenack**, vice president-sales, was elected to succeed **George A. Long** as executive vice president. Mr. Long remains in a consulting capacity.

Appointments to the staff of **Westinghouse Electric Corp.'s** new air-conditioning division, which will be housed in a new plant now under construction at Staunton, Va., include: **William B. Cott**, sales manager; **John L. Ditzler**, engineering manager; **Clifford M. Sayre**, manager of manufacturing; **Charles E. Smoyer Jr.**, manager of accounting; **Harold L. Goehring**, industrial relations manager; and **John C. Feick Jr.**, purchasing agent.

**Donald M. Walker** was named product manager for pig, ingot and billet by **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. He is replaced as assistant product manager by **A. V. Lorch**. **Charles**

NORMAN K. ANDERSON
. . . Warner Electric Brake gen. sales mgr.

HERSHNER CROSS
. . . gen. mgr. of GE's Distribution

JACK ROTHSCHILD
. . . Eastern Brass & Copper v. p.

**B. Willmore** was made technical specialist for pig, ingot and billet in the Cleveland sales office.

**Norman K. Anderson** was made general sales manager of **Warner Electric Brake & Clutch Co.**, Beloit, Wis. Formerly industrial division manager, he joined Warner in 1946.

**Pittsburgh Steel Co.** appointed **Thomas H. Knox** superintendent of its sheet mill division at Allenport, Pa. He will supervise operations at the new hot and cold-rolling mills and succeeds **W. Harrison Webb,** who resigned to accept a position with another company. **Paul Totten** was made superintendent of cold reduction. Under Mr. Knox, he will supervise operations of pickling, cold reduction, annealing and temper rolling.

**Alvin E. Seeman** was elected president of **Acklin Stamping Co.**, Toledo, O., to succeed **F. Cyril Greenhill** who becomes chairman of the board.

**William L. Smith** was appointed general manager of **Fairchild Speed Control Division,** Wickliffe, O., Fairchild Engine & Airplane Corp.

**Hershner Cross,** former general manager of **General Electric Co.'s** Trumbull Components Department, was appointed general manager of the company's Distribution Assemblies Department at Plainville, Conn., which manufactures low voltage power distribution equipment in seven plants throughout the country.

**Wesley R. Johnson** was made eastern district manager for Illinois Tool Works' **Shakeproof Division,** Elgin, Ill. He is replaced as sales representative for the New York area by **Robert S. Carroll.**

**Ernest W. Christener,** formerly sales manager, was made manager of the reinforcing department of **Joseph T. Ryerson & Son Inc.'s** Chicago plant.

**Jack Rothschild** was elected vice president of **Eastern Brass & Copper Co.**, New York. He joined the firm in 1951 as assistant to the president.

Promotions at **Standard Pressed Steel Co.**, Jenkintown, Pa., include **Edwin Y. Bready,** former director of purchases, made division manager, Hallowell Pressed Steel Division; **Charles A. Thomas Jr.,** now in charge of production control, quality control, estimating and cost analysis in addition to his previous position as manager of industrial relations and industrial engineering; and **James L. MacDowell,** advanced from manager of tooling and quality to superintendent of manufacturing, fastener division.

**Midland Steel Products Co.** appointed **Arnim Luedtke** manager of its Cleveland division.

**Sidney J. Tuson** was appointed a sales representative for the foundry sales division of **Frederic B. Stevens Inc.,** Detroit. He covers eastern Michigan and the eastern half of Wayne county.

**Dr. Kenneth H. Kingdon** was appointed manager of the new nucleonics and radiation section of **General Electric Co.'s** research laboratory at Schenectady, N. Y. **Dr. Ernest E. Charlton** is consultant on radiation to the newly formed section.

**Upson-Walton Co.,** Cleveland, appointed **Raymond J. Considine** New York district manager and **H. B. Korman** Cleveland district manager to succeed **Herbert Roesinger,** retired.

**G. E. Altmansberger** was made assistant general manufacturing manager, **Lincoln-Mercury Division,** Ford Motor Co., Detroit. He has been manager of Ford's operations analysis department.

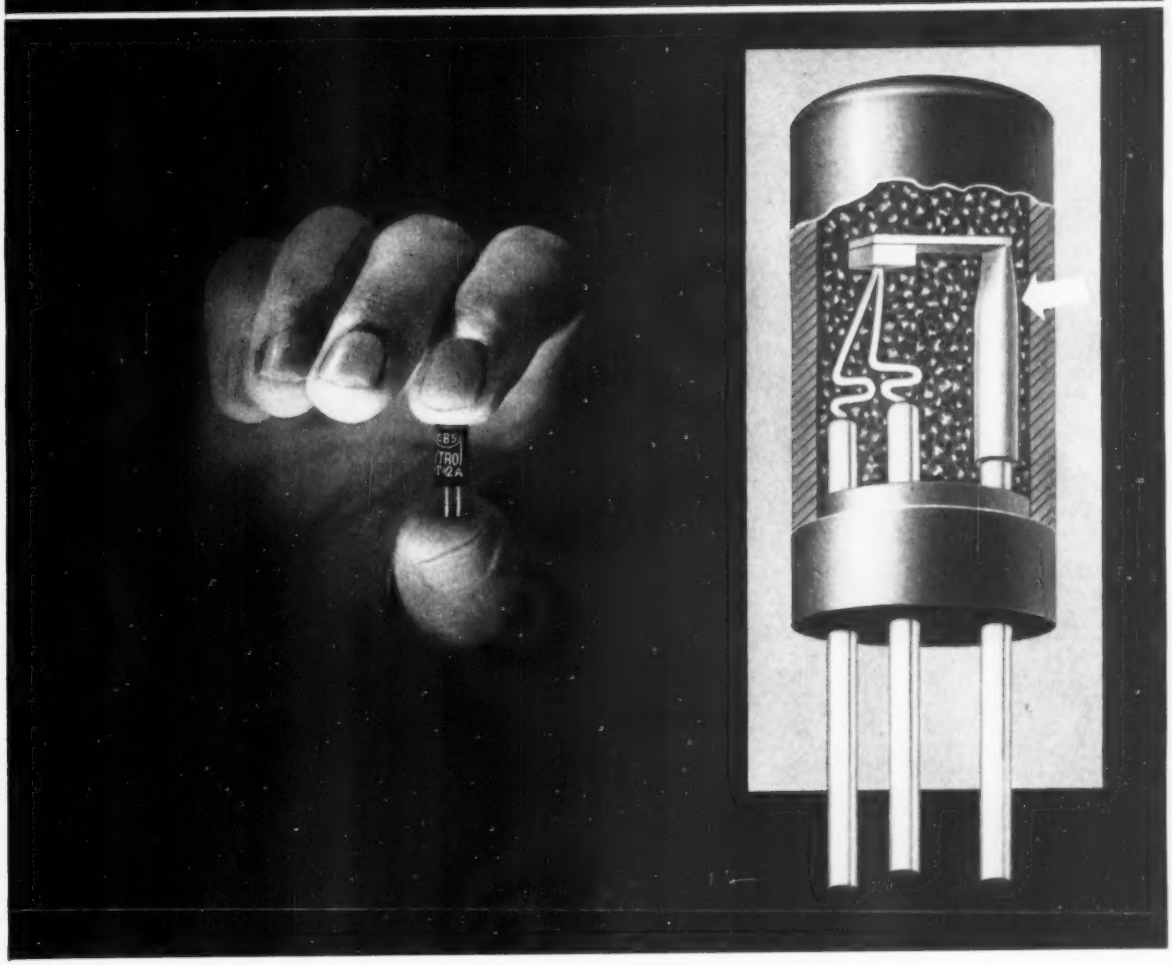
**Vernon E. Nickel** was made manager, tractor sales department, and **Thomas G. Heydon** manager of sales research department, Tractor and Implement Division, Ford Motor Co., at Birmingham, Mich.

**J. A. Dickson** was named district manager of the southeastern states for the steel strapping division of **Stanley Works.** His headquarters will be at Atlanta.

**Wilkerson Corp.** Englewood, Colo., appointed **Ronald C. Martin** vice president in charge of sales. He formerly was with Sloane Delaware Products where he served as Chicago regional sales manager.

**Penn Metal Co. Inc.** named **F. Wayne Sayre** east central district

# Transistors use Tubing...can you?




Something has happened in electronics of importance to you in more ways than one.

It's a tiny device called the Transistor—successor, enthusiasts say, to some vacuum tubes.

The one above, made by CBS-Hytron, a division of Columbia Broadcasting System, Inc., is no larger than your little finger nail.

You'll soon be listening to or looking at transistorized radio and TV—or saving space, weight and power with transistors in other equipment, such as telephones, calculators or computers. Then the materials in a transistor will be of top importance to you.

Each CBS-Hytron transistor contains a gnat-sized bracket made possible by using the good welding, soldering and formability properties of seamless nickel tubing.

Whether you need one foot of tubing for a trial balloon or one million feet for production, let Superior people and Superior's 55 analyses help you. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

**Round and Shaped Tubing Available in Carbon, Alloy, and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium.**

**Superior**

THE BIG NAME IN SMALL TUBING

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. RAymond 3-1331

**All analyses .010" to ⅝" O.D.**
**Certain analyses in Light Walls up to 2½"**

JACK E. LYNCH

W. KENT MATHIAS

PHIL C. HEWETT

KEN P. MARTIN

*. . . sales executives at Cincinnati Milling & Grinding Machines*

sales manager with offices in Parkersburg, W. Va., plant. **J. R. Mummert** was made Chicago district sales manager.

Appointed to the staff of **Carl M. Beach**, vice president and domestic sales manager, **Cincinnati Milling & Grinding Machines Inc.**, Cincinnati, sales subsidiary of Cincinnati Milling Machine Co., are: **Jack E. Lynch**, named manager, standard milling machine sales, and **W. Kent Mathias**, as manager of standard grinding machines sales. **Phil C. Hewett** was assigned to the special machine tool division as manager, special machine tool sales. **Ken P. Martin** is now sales manager, machinery division, responsible for Hydroform deep drawing machines, Flamatic hardening machines and allied equipment.

**F. Jerome Tone Jr.**, a director and vice president-sales, **Carborundum Co.**, Niagara Falls, N. Y., was named senior vice president of the company. **Frederick T. Keeler** was promoted to director of sales. He has been marketing director since 1950.

**R. A. Stauffer** and **K. G. Donald** were elected directors of **National Research Corp.**, Cambridge, Mass. Mr. Stauffer, who has been vice president and director-research since 1949, is also vice president and a director of Vacuum Metals Corp., jointly owned by Crucible Steel Co. of America and National Research Corp. Mr. Donald, assistant treasurer and a director of Vacuum Metals, has been vice president-treasurer of National Research.

**James G. Wray** was appointed manager of the equipment division plant of **Continental Can Co.**, Syracuse, N. Y.

**R. B. Sayre**, vice president, **Graybar Electric Co.**, New York, was elected a director and member of the executive committee.

**Lawrence M. Limbach** was elected vice president of manufacturing, **Ryan Aeronautical Co.**, San Diego, Calif. Formerly manager of operations, steel and tube division, Republic Steel Corp., he joined Ryan as works manager in 1952.

**Detrex Corp.**, Detroit, appointed **Phil H. Richey** assistant works manager. He continues to serve as assistant treasurer.

**William O. Hill** was named to fill the newly created post of sales promotion manager at **Dodge Division**, Chrysler Corp., Detroit.

**Frank Warner**, director of purchases at **Crosley Division**, Avco Mfg. Co., Cincinnati, retired.

**Phoenix Mfg. Co.**, Joliet, Ill., appointed **John W. Gosselin** vice president.

**John H. Crankshaw** was promoted to vice president in charge of engineering at **J. A. Zurn Mfg. Co.** and its affiliates, American Flexible Coupling Co. and Zurn Research & Development Co., all of Erie, Pa. He previously was associated with General Electric Co.'s engineering department.

**Eugene B. Mapel** was made a vice president of **Barrington Associates Inc.**, New York.

**L. G. Currie** was made a district sales manager for **Marion Power Shovel Co.** to cover the southern part of Indiana and Illinois and parts of Kentucky.

**Sterling Abrasives Division**, Cleveland Quarries Co., Tiffin, O., appointed **James L. Goodwin** Cleveland district manager.

**McKellar Graham** was appointed chief designer, **Airway Products Inc.**, Pontiac, Mich. He formerly

# WICKWIRE WIRE

## puts the ease in your easy chair

**To be truly comfortable the upholstery in a chair or couch must have the right kind of springs formed from the right kind of wire.**

**Wickwire Gamma Spring Wire—specially processed for upholstery use—has won outstanding preference in this service because manufacturers have found they can always depend upon it for long-lasting retention of resiliency and shape.**

**Here's just one more example of the wide diversity of application embraced within the complete range of Wickwire Wire. Let us know your requirements in any specialty steel wire. We are prepared to meet your most exacting specifications for wire of high or low carbon steel—round or shaped—in all tempers, finishes and grades.**

***for the wire you require—check first with Wickwire***

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia

2055

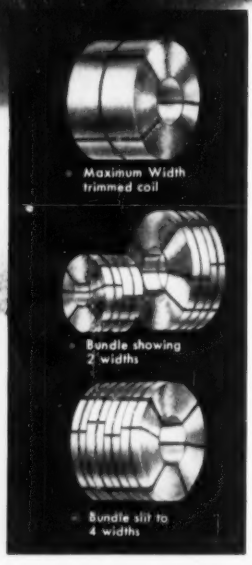
**WICKWIRE WIRE**

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

# A.W.

# CONTINUOUS MILL

**PLATE • SHEET • STRIP—*available in hot rolled quality***




*More than a century and a quarter of iron and steel making experience.*

The quality of Alan Wood Steel is of prime importance to both our customers and ourselves. Our Continuous Mill produces steel from .059″ to .500″ to a maximum width 25½ inches, furnished in coils or cut lengths as required. Rigid metallurgical control means that you get *what you want!* Years of steel making experience plus our mine-to-mill undivided responsibility assures you the best quality steel possible to produce.

Because we're located in the heart of the East's great industrial and transportation area, we can often make faster delivery.

## ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

RAY J. STEWART
. . . president of Cleveland Metal Abrasive

HAROLD E. MARTIN
. . . Brown & Sharpe cutting div. supt.

NATHANIEL E. DUVAL
. . . heads Michiana Products Corp.

was a project engineer at Vickers Inc.

**Ray J. Stewart,** vice president, was elected president of **Cleveland Metal Abrasive Co.,** Cleveland, to succeed his father, **O. S. Stewart,** now chairman of the board.

**Ben Karpowicz** was elected vice president in charge of production for **Pak-Rapid Inc.,** Philadelphia.

**Arthur M. Grasse** was elected vice president in charge of industrial products, **Goodman Mfg. Co.,** Chicago. Associated with Goodman for 33 years in various divisions, he has been manager of its industrial manufacturing division. He continues in charge of this division as well as the newly acquired Diamond Iron Works line of crushing, screening and handling equipment.

**Harold E. Martin** was named division superintendent of a newly created metal cutting tool division of **Brown & Sharpe Mfg. Co.,** Providence, R. I. He will have charge of the present cutter manufacturing, hardening and engineering departments, as well as the cutter office.

**Harold G. Lolley,** former foundry superintendent at Rosedale Foundry & Machine Co., Pittsburgh, joined **Thiem Products Inc.,** Milwaukee, as sales service engineer.

**Severn W. Kittredge** was named manager of operations of Sharon Steel Corp's **Brainard Steel Division.** His jurisdiction includes plants in Warren, O., and one at Orwell, O. He had been manager of the strapping plant.

**Nathaniel E. Duval** joined **Michiana Products Corp.,** Michigan City, Ind., as president. He succeeds **Otto M. Carry,** retired, who headed the company for 25 years. Formerly vice president of Massachusetts Mohair Plush Co. Inc., Mr. Duval served for the last three years as a Michiana director.

**Henry A. Lowry** was elected president and treasurer, **Seaboard Steel & Iron Corp.,** Baltimore. **Reginald Abercrombie** and **G. Irving Hubbard** were elected vice presidents, **Harold M. House** secretary and **Henry A. Lowry Jr.** assistant secretary.

**Bruce H. Atwater** was named manager of the aircraft division of **Clary Multiplier Corp.,** San Gabriel, Calif.

## *OBITUARIES . . .*

**John MacAuley Brown,** director of purchasing at **Veeder-Root Inc.,** Hartford, Conn., died Mar. 20.

**W. S. Robinson** of Benton Harbor, Mich., died Mar. 24. He had been connected with the malleable iron foundry industry for 67 years. He helped found and in 1947 became vice president of **Muncie Malleable Foundry Co.,** Muncie, Ind., and had served as a director of the company.

**Karl M. Leute,** 59, president, **Lithium Corp. of America,** Minneapolis, died Mar. 25. He also headed Manganese Chemicals Corp., same city.

**Edward H. Gurney,** 70, chairman, **Gurney Industries Ltd.,** died Mar. 19 in Toronto, Ont. He was general manager of Gurney Dominion Furnaces Ltd., president and director of Gurney North-West Foundry Co. Ltd., of Gurney-Massey Co. Ltd., Gurney Properties Ltd. and Electric Steels Ltd.

**Alonzo F. Allen,** retired secretary-treasurer, **American Steel & Wire Division,** U. S. Steel Corp., Cleveland, died Mar. 24.

**Edward M. Kolman,** 54, industrial and technical representative of **Kester Solder Co.,** Newark, N. J., for over 25 years, died Mar. 23.

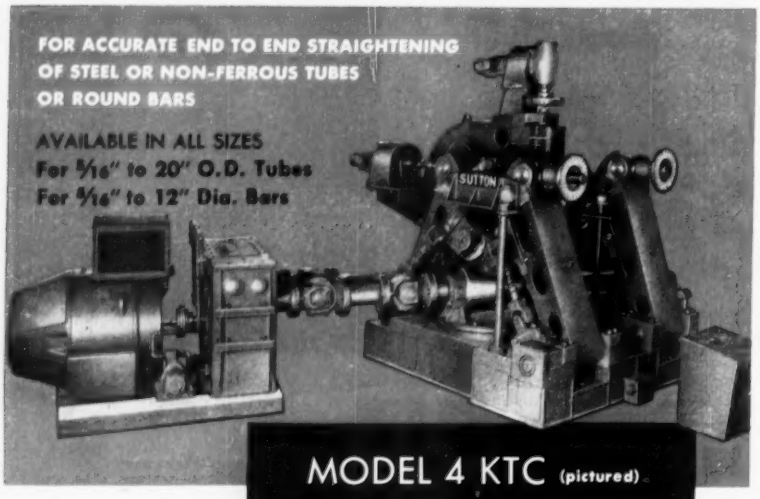
**Arthur W. Wainwright,** 65, financial vice president, **Emhart Mfg. Co.,** Hartford, Conn., died Mar. 23.

**Edward J. Markey,** 61, president, **National Annealing Box Co.,** Washington, Pa., died Mar. 19.

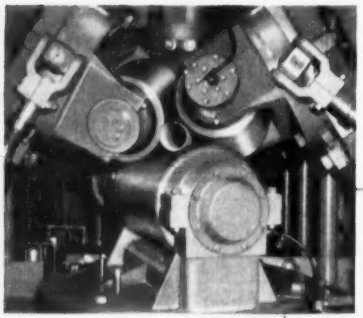
**Earl P. Putrow,** 58, president, **Hy-PneuMat Inc.,** Milwaukee, died Mar. 20.

**Raymond E. Porter,** 82, founder of **Porter-Cable Machine Co.,** Syracuse, N. Y., died Mar. 18.

# NEW SUTTON 7-Roll STRAIGHTENERS

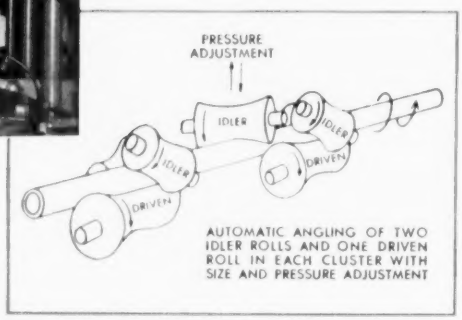

FOR ACCURATE END TO END STRAIGHTENING
OF STEEL OR NON-FERROUS TUBES
OR ROUND BARS
AVAILABLE IN ALL SIZES
For 5/16" to 20" O.D. Tubes
For 5/16" to 12" Dia. Bars
SUTTON
MODEL 4 KTC (pictured)
TUBES FROM 3⅜" O.D. to 12" O.D.
BARS FROM 3⅜" to 7½" Dia.

Patented cluster roll arrangement positively confines work to pass line from entry to delivery without guides. Roll angles are automatically adjusted to proper setting with full contact between work and rolls.



- TRULY GUIDELESS
- HIGH PRODUCTION
- QUALITY STRAIGHTENING

*Photo and diagram of 7-roll design shows engineering principle of cluster roll arrangement.*




*Ask for Bulletin No. 25*

**SUTTON *Engineering* COMPANY**

**Manufacturers for Ferrous and Non-Ferrous Metal Industries**

STRAIGHTENERS, EXTRUSION PRESSES, HYDRAULIC STRETCHERS,
SHEET LEVELLERS, GAG PRESSES, ROTARY CLEANERS,
HEAVY-DUTY UNIVERSAL JOINTS, ROLLS.

BELLEFONTE, PENNSYLVANIA


## Westinghouse Opens Plant

**Refrigerator production hits 800 a day. Company expands other appliance plants**

EIGHT HUNDRED refrigerators a day are being produced at the recently completed Columbus, O., plant of Westinghouse Electric Corp.'s Electric Appliance Division. At top capacity the plant can produce 4000 major appliances a day.

The new plant covers about 2 million sq ft and eventually will employ about 7000. There are four manufacturing aisles, each 200 ft wide and nearly 1500 ft long. The warehouse area has storage space for 100,000 major applances.

Sales of all Westinghouse electric appliances were up 5 per cent in January and February, 1954, compared with the same period last year. John Ashbaugh, vice president, Electric Appliance Division, says that if business conditions remain about the same, sales in 1954 will be 15 per cent better than last year, the best in history for the division.

A $7-million expansion program has begun at the division's Mansfield, O., and East Springfield, Mass., plants. The Mansfield plant, headquarters for the division, assembles refrigerators and produces electric ranges, Laundromats, clothes dryers and other major household appliances. The East Springfield plant turns out the compressors for the refrigerators assembled at Mansfield and makes commercial refrigeration equipment, fans and vacuum cleaners. The new plant at Columbus eventually will take over all manufacturing and assembly of Westinghouse domestic refrigerators.

## Orders Total $13 Million

Unfilled orders worth $13 million and contracts acquired in the normal course of business will carry National Steel and Shipbuilding Corp., San Diego, Calif., well into 1955.

Last year, National led Pacific Coast shipyards in tonnage of vessels under 300 ft in length. The year was the best in the company's

(*Please turn to page* 89)

# CRUCIBLE REXWELD hard surfacing rods increased forging die life OVER 400%

*for R. G. LeTourneau, Inc.*

By Rexwelding, R. G. LeTourneau, Inc., Longview, Texas, increased the life of its production dies over 100%. The dies shown, for example, used to forge a plug adapter of SAE 1030 steel at 2350 F, had to be removed from the press after forging 3100 pieces because of excessive wear and heat checking. The same die, after worn areas were machined out and faces built up with Rexweld-A hard surfacing rod, produced 9300 pieces.

You can do the same in your shop. You'll find that Rexwelded dies have higher edge strength at elevated temperatures, and resist chipping, deformation and heat checking better. And parts can be Rexwelded over and over.

So, use Rexweld Rods on your next hard surfacing application. They are available in both bare rods and low hydrogen coated electrodes, in a wide range of grades and sizes. Call your local Crucible representative — he can provide a grade of Rexweld adapted to your specific job.

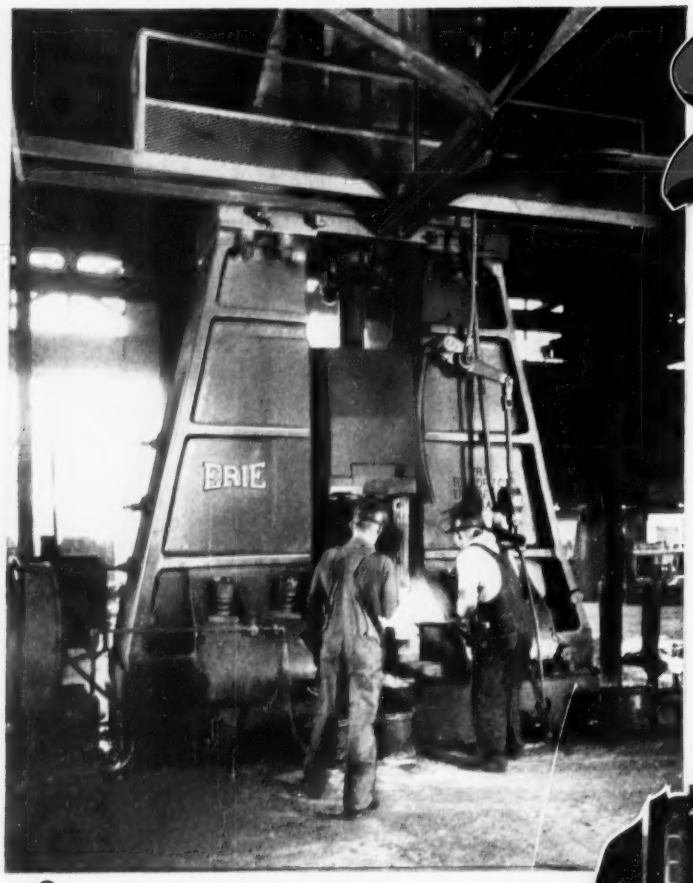
Join your Civil Defense Team NOW!

**CRUCIBLE** first name in special purpose steels

*54 years of Fine steelmaking*

**REXWELD HARD SURFACING ROD**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

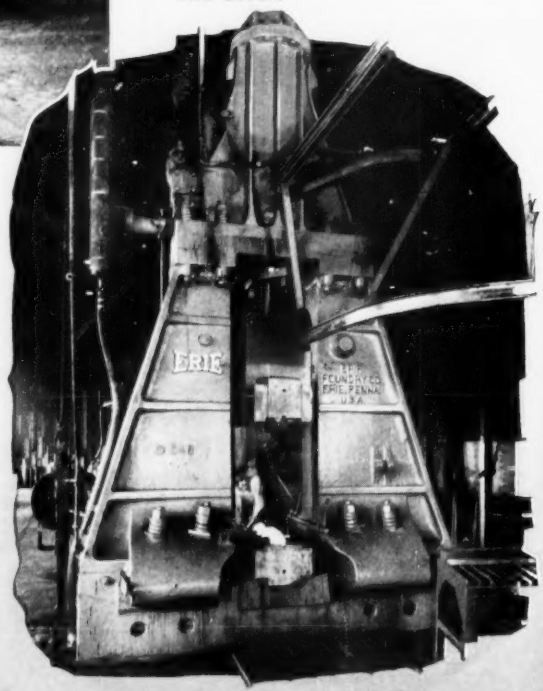



# 21 ERIE

## STEAM HAMMERS HERE!

A large mid-western forge shop is making quality automotive forgings on 2 Erie Steam Hammers of 12,000 lb. rating, 10 Eries of 5,000 lb. rating and 9 Eries of 15,000 lb. rating. Why? Mainly because Erie Hammers are the choice of experienced Hammergangs and of the management men who pay the bills. Rugged Dependability is the answer—Erie Hammers produce profitably!

*On Erie Hammers all stressed parts, frame, anvil, upper works are steel.*




9 - 15,000 lb.

2 - 12,000 lb.

10 - 5,000 lb.

ERIE

Write for Bulletins Describing in Detail Erie Steam Drop, Board Drop, Single and Double Frame Forging Hammers, Pneumatic Hammers and Trimming Presses.

**ERIE FOUNDRY COMPANY**

*Erie, Pa., U.S.A.*

**ERIE BUILDS *Dependable* HAMMERS**

(*Continued from page 86*)

history. Repairs to fishing and commercial vessels and the output of gray iron, bronze and other castings will add substantially to the business volume this year.

### Ore Pier Begins Operations

The first vessels bringing foreign ore to Pennsylvania Railroad's new $10-million ore pier at Philadelphia are unloading on a trial-run basis. The pier is equipped to unload two ships at once at a rate of 3600 tons of ore an hour, with provisions to expand capacity to handle four ships simultaneously at a rate of 10,800 tons an hour.

### Zinsco Building Plant

Zinsco Electric Co. is constructing a factory at 470 Jackson St., Los Angeles, for manufacture of electrical switchboards and other electrical control equipment. Martin Zinsmeyer is president.

### California Firm Changes Name

Stronghold Pacific Corp., Downey, Calif., changed its name to Olympic Screw & Rivet Corp. to describe its products more accurately.

## Thompson Enters New Field

**Cleveland firm negotiates with Dage Electronics, maker of television cameras**

THOMPSON Products Inc., Cleveland, manufacturer of aircraft, automotive and electronics parts, has negotiated for the purchase of Dage Electronics Corp., Beech Grove, Ind. The move marks Thompson's entry into an entirely new field; Dage produces Vidicon television cameras and related equipment for professional studio use and for closed circuit industrial and other applications.

The Dage products will not conflict with any existing Thompson line said William M. Jones, manager of Thompson's Electronics Division, who outlined a wide range of uses for a line of small, inexpensive television cameras made by Dage.

**All-Seeing Eye**—These cameras can be used to extend the normal range of visual observation in banks, industrial plants, railroad yards and prisons. Through their use, a classroom full of students can make observations through a single microscope.

A surgical operation can be followed step by step by projecting the picture on a screen in the amphitheater while the surgery is taking place. Because of their relatively low cost, apartment house tenants could even use an installation to show them who is ringing their doorbell.

The cameras will also be useful for closeup observation of hazardous operations at military and atomic projects.

The Dage assembly plant near Indianapolis will continue in its present location, operating as a decentralized unit of Thompson's Electronics Division.

### Bus Parts Negotiations End

Officers of ACF-Brill Motors Co., Philadelphia, and Twin Coach Co., Kent, O., jointly announced that negotiations for the proposed sale to Twin Coach of the ACF-Brill bus service parts business and inventory have been terminated by mutual consent.

### Widens Metals Explorations

National Lead Co., New York, will explore a large area in the northern part of the Australian continent. The regions to be explored have shown indications that they might contain ores of copper, nickel, lead and zinc. Operations are being carried out by the company's Australian subsidiary, Titanium Alloy Mfg. Co. Pty. Ltd.

### Plans To Build Oxygen Plant

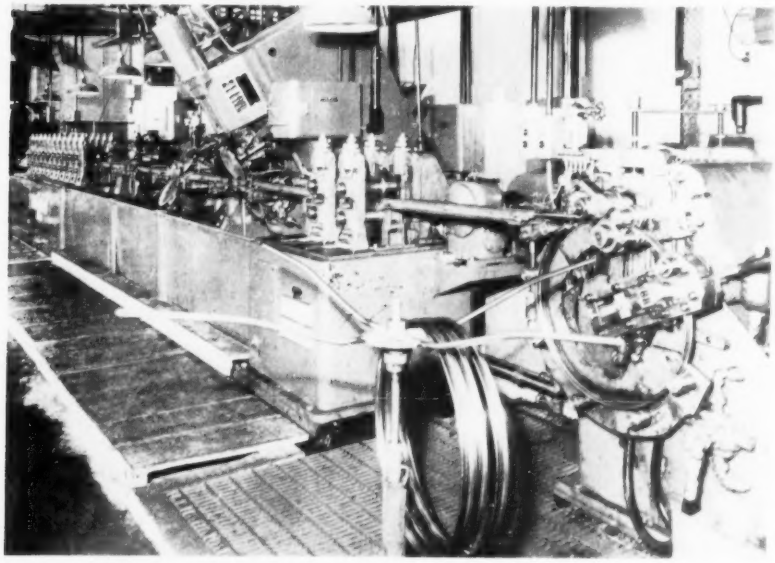
National Cylinder Gas Co., Chicago, will build a $3.5-million plant for manufacturing and distribution of liquid oxygen on a site located on the south side of Chicago. The firm has three other plants in that city making industrial gases.

### Atomic Power for Pittsburgh

Duquesne Light Co., Pittsburgh, and Atomic Energy Commission are negotiating a formal contract for construction and operation of the nation's first full-scale central station nuclear power plant. Westinghouse Electric Corp. already has the contract to develop, design and construct the reactor part of the plant.

Lewis L. Strauss, chairman of AEC, estimated the Duquesne pro-

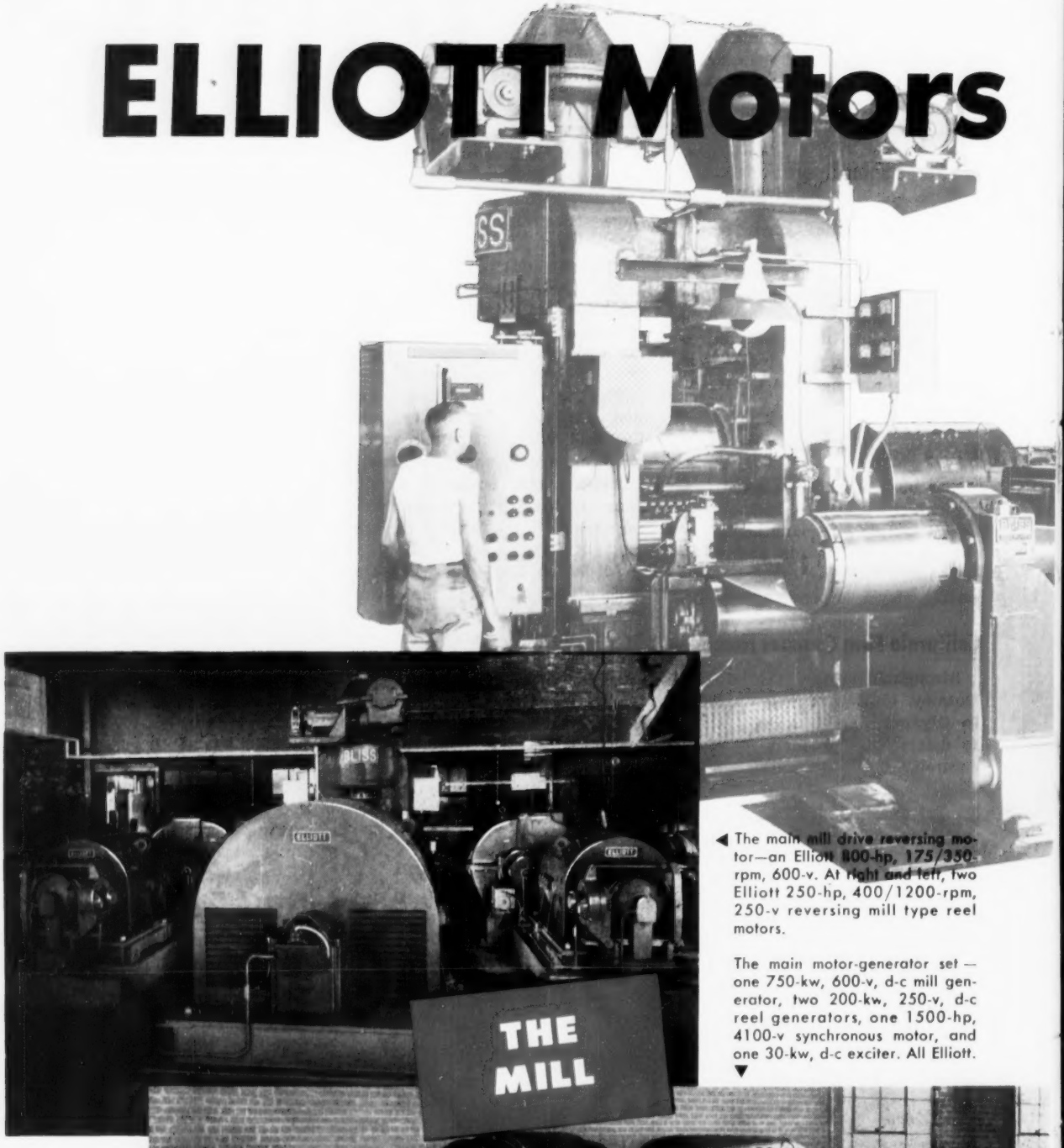
(*Please turn to page 92*)



**Seam Welding Bicycle Rims**

Taylor-Winfield Corp., Warren, O., manufacturer of resistance welders, built three seam welders into a production line 40 feet long. Flat strip (.028 inch thick) is fed at the rate of 35 feet per minute. Formed to shape, the edges fold together and are resistance seam welded by seam welders. An average of 5 to 6 rims per minute are turned out, depending on size

# ELLIOTT Motors




◀ The main mill drive reversing motor—an Elliott 800-hp, 175/350-rpm, 600-v. At right and left, two Elliott 250-hp, 400/1200-rpm, 250-v reversing mill type reel motors.

The main motor-generator set—one 750-kw, 600-v, d-c mill generator, two 200-kw, 250-v, d-c reel generators, one 1500-hp, 4100-v synchronous motor, and one 30-kw, d-c exciter. All Elliott. ▼

Elliott FABRI-STEEL MOTORS AND GENERATORS

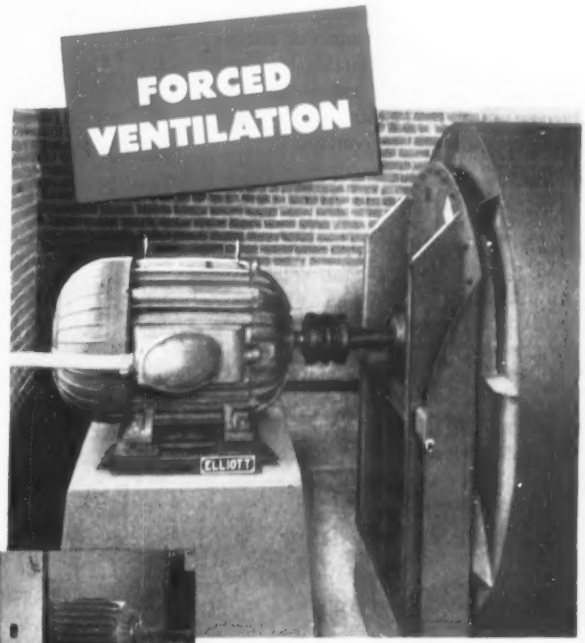
Q3-5

# and Generators

## *power the new cold mill and slitter line for the Athenia Division, National Standard Co.*

● The new Bliss 10 in. and 24 in. by 20 in. Four-High Reversing Cold Reduction Mill, with the Bliss 16 in. by 18 in. Slitter, adds new high capacity as well as quality product for the National Standard Company's Athenia Steel Division.

All electric motor drives, generators, and control for both the mill and the slitter line were furnished by Elliott Company. Generators, motors, and control have been carefully coordinated to give the close speed regulation necessary for the production of high quality strip.




▲ The Elliott C-W "Sealedpower" 40-hp totally-enclosed fan-cooled motor that drives the fan supplying ventilation for the mill and reel motors.

◀ The drive for the Bliss Slitter is a Crocker-Wheeler 75-hp drip-proof induction motor. In the right background, an Elliott C-W 15-hp threader motor.

**ELLIOTT Company**

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

***CROCKER-WHEELER DIVISION • RIDGWAY DIVISION***

(Continued from page 89)

posal would save the government $30 million during the construction period and five years of operations.

Under the proposal, Duquesne would: Furnish a site for the project and build a new electric generating plant at no expense to the government; operate the reactor part of the plant and bear the labor costs entailed; assume $5 million of the cost of research, development and construction of the reactor part of the plant; pay the commission at the rate of 48.3 cents per million Btu's of steam used in the turbines for the first year, the rate to increase annually until it reaches 60.3 cents in the fifth year; and waive any reimbursement by the government of costs incident to termination of the contract.

## Kaiser Makes Safety Award

T. J. Ready, Jr., vice president and general manager, Kaiser Aluminum & Chemical Corp., presented the company's Newark, O., works with the Kaiser Safety Cup for 1953 in competition among 11 Kaiser Aluminum plants. J. T. Dugall, manager, rod, bar and wire operations accepted the cup on behalf of Newark employees.

## Rolle Enlarges Facilities

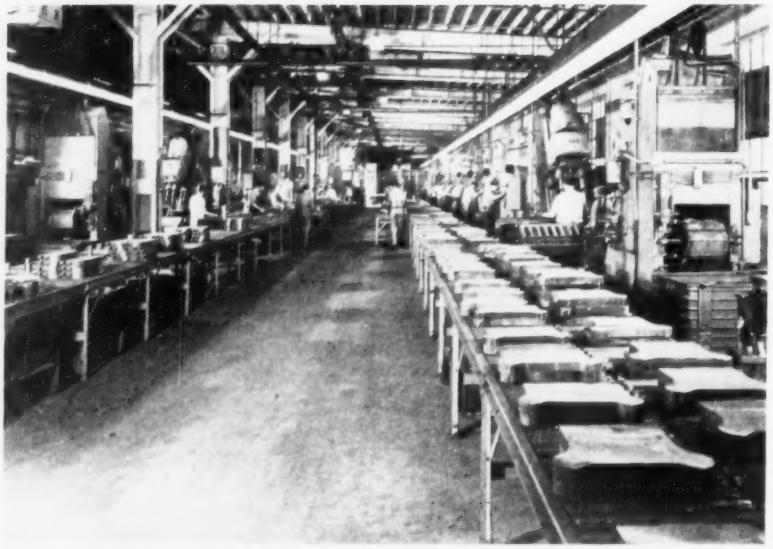
Rolle Mfg. Co., Lansdale, Pa., has expanded its permanent mold facilities. In addition to making a major increase in plant area allocated to this phase of the company's operation, this magnesium and aluminum foundry acquired the services of an outstanding European permanent mold and die casting autority.

## Plating Firm Builds Plant

Southern California Plating Co. is constructing a 3200-sq-ft plant at 3434 San Fernando Rd., Los Angeles, for manufacture of license frames, auto accessories, dies, jigs and fixtures, aircraft parts, and metal parts.

## Steel Warehouse Organized

Anchor Steel Warehouse Inc., 1601 25th St., Kansas City, Mo., a recently formed company, is distributing steel bars, shapes and sheets. W. R. Stephenson is president. J. W. Speakman, H. A. Sundberg, E. D. Hamley and E. B. Yost are the other officials.



**Mass Production Techniques Applied to Die Setting**

Two production lines are devoted to die set manufacturers at Danly Machine Specialties Inc., Chicago. Special tooling is used to make rotary milling fast, surface grinding assures a flat, true working surface, and final broaching guarantees accurate sizing and parallelism of guide post and bushing holes. Inspection stages are at all critical points

## REPRESENTATIVES

**Beckett-Harcum Co.,** Wilmington, O., now has a branch office in Birmingham headed by H. H. Hackett. The company makes air and hydraulic control equipment.

**Joy Manufacturing Co.,** Pittsburgh, opened a district office in Cleveland for sales and service of its machinery in industrial, metal and other operations in the Ohio-Michigan area.

**Marion Power Shovel Co.,** Marion O., appointed Cunningham-Ortmayer Co., Milwaukee, to handle the sale, servicing and distribution of Marion machines in Wisconsin.

**Parker Appliance Co.,** Cleveland, producer of hydraulic and fluid system components, appointed two new distributors. Industrial Piping Supply Co., Charlotte, N. C., will handle Parker's line of tube fittings, fabricating tools, dual heat transfer coils, pressure gage snubbers, draft gage manifolds and thread sealers. Phelps Packing & Rubber Co. Inc., Baltimore, will distribute Parker O-Rings.

**Morse Chain Co.,** Detroit, appointed Power Transmission Equipment Co., Chicago, as exclusive Chicago area distributor of Morse mechanical power transmission products including chains, sprockets, couplings, clutches, driveshafts and other products.

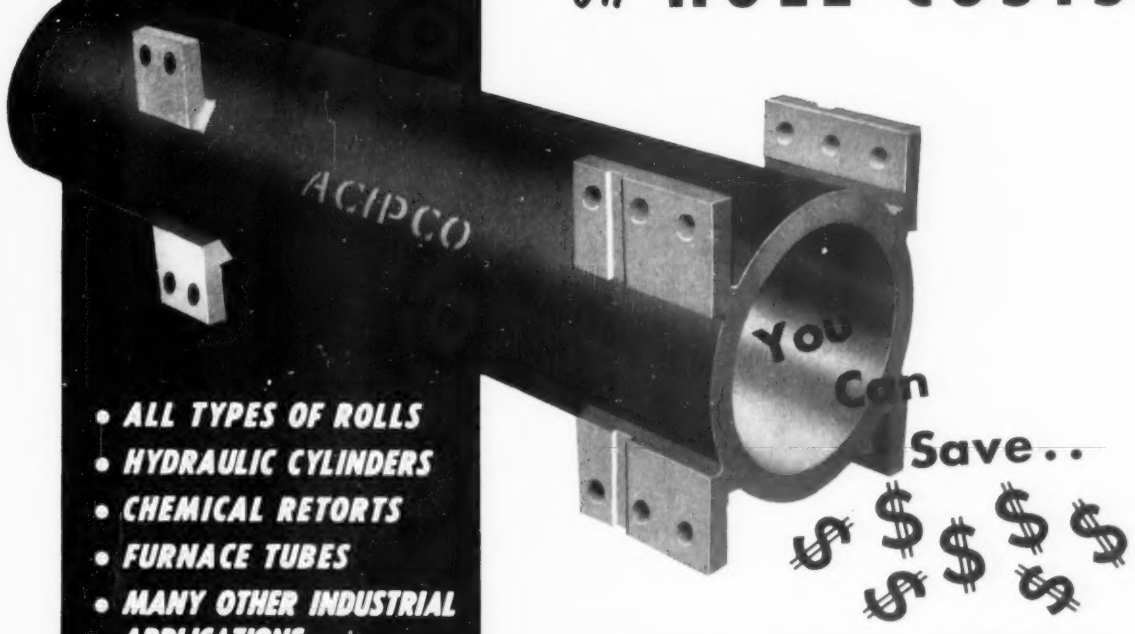
A new sales office and warehouse were established in Detroit by **Metal Removal Co.,** Chicago, manufacturer of abrasives and die sinking tools.

**Michigan Oven Co.,** Detroit, designer and builder of industrial heating and processing ovens, appointed J. R. Engle Co., Cleveland, as representative in the northeastern Ohio area.

**Rochester Products Division** of General Motors Corp., Rochester, N. Y., opened a Detroit sales office. Harold Stahl is in charge. The division makes automotive parts and accessories.

**Pennsylvania Flexible Metallic Tubing Co.,** Philadelphia, named

# STOP! ..Going In The Hole on HOLE COSTS!

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- HYDRAULIC CYLINDERS
- CHEMICAL RETORTS
- FURNACE TUBES
- MANY OTHER INDUSTRIAL APPLICATIONS

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*Centrifugally Spun* **TUBES**

WHY CONTINUE to throw money down the drain by paying for the hole in your tubular castings. Switch to ACIPCO STEEL centrifugally spun tubing with the hole tailored to fit your specific needs—and save!

ACIPCO STEEL tubes are serving in a variety of industrial uses and their exceptional value as a component in weldment applications is widely recognized. They can be furnished rough as-cast, finished machined or honed to the customer's requirements. Outside diameters range from 2.25" to 50" O.D., and in the large sizes ACIPCO tubes have a decided advantage over hollow-bored forgings. Wall thicknesses range from .25" to 4".

ACIPCO STEEL tubes can be furnished in all the alloy grades including heat and corrosion-resistant stainless steels as well as the plain carbon grades. Special non-standard analyses are also available. Tubes are manufactured in lengths up to 16 feet—longer lengths being supplied by welding tubes together. In ACIPCO tubes there is an absence of directional lines of weakness found in many other tubular castings. Investigate the many advantages offered by this versatile product.

**AMERICAN CAST IRON PIPE COMPANY**

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Strong, Carlisle and Hammond Co.
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Cleveland 13, Ohio

Lyman Tube and Bearings, Ltd.
928 Ste. Sophie Lane
Montreal 3, Canada

J. M. Tull Metal and Supply Co., Inc.
285 Marietta Street, N. W.
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Ducommun Metals and Supply Co.
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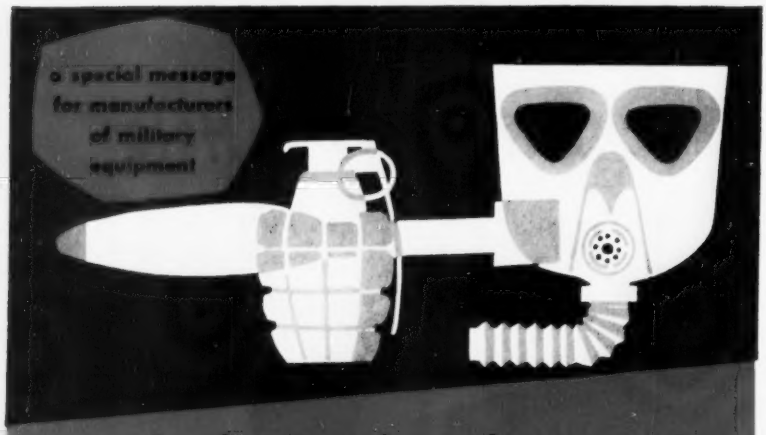


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**ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

**ON COPPER . . .** Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

**ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

**ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

**AND IRIDITE IS EASY TO APPLY.** Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

**WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.**

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WEST COAST LICENSEE: L. H. Butcher Co.


Republic Supply Co. of California, Los Angeles, as exclusive distributor in that state for Penflex flexible metallic tubing. Penflex tubing products include steam lines, flexible exhaust and intake pipes, hoses for gasoline, hot tar and asphalt and similar specialties.

**Trane Co.**, La Crosse, Wis., manufacturing engineers of air-conditioning, heating and ventilating equipment, opened sales offices at Greenville, S. C., and Duluth. R. G. Beck heads the Greenville offices, and Robert T. Dean is in charge at Duluth.

**Waukesha Tool Co.**, Waukesha, Wis., appointed Production Service Co., Cleveland, as sales representative in northern Ohio. Production Service will use its traveling display vans to present Waukesha tools to customers.

## NEW ADDRESSES

**American Gear Manufacturers Association** moved headquarters to 1 Thomas Circle, Washington 5. The office was in Pittsburgh.

**Fray Machine Tool Co.** moved its manufacturing-engineering services and main offices to a new plant at 2935 N. Ontario St., Burbank, Calif.

**Lockheed Aircraft Corp.** moved its expanding Missile Systems Division from Burbank, Calif., to the company's Van Nuys plant. Elwood R. Quesada, vice president, is general manager of the Missile Systems Division.

**Morey Machinery Co. Inc.** now has executive offices at 383 Lafayette St., New York 3. The company expects to have a machine tool display room on the ground floor of the building.

**R.E.C. Corp.**, New Rochelle, N.Y., manufacturer of stud bolts and threaded rods, now has general offices at 47 Cedar St., that city.

**Muratet & Co.** moved to 117 West Latimer, Tulsa, Okla., and has changed its firm name to Midwest Supply Co. The firm repre-

# *"Have you thought of steel tube?"*

"I've been thinking of the points you mentioned and, frankly, I am sure Wolverine electric-welded steel tube will do everything you want and save you money to boot!"

"That's fine, but what about finishing."

"Look at this sample. You can paint it, or if your operations call for plating, you can get it in a suitable finish for that, too. On top of that, electric-welded steel tube is strong, easy to fabricate, and simple to join by soldering, welding or other fastening methods."

"Steel tube might be the answer at that."

"And Wolverine's quality control program is a standout bonus! Their reputation for making tubing to close tolerances and with uniform wall thicknesses assures you continuing product satisfaction."

***IF QUALITY IS A "BUY WORD" IN YOUR PLANT:*** Wolverine is the tube for you. Remember it's available in these analyses: SAE 1010, SAE 1015, SAE 1020, SAE 1025, SAE 1030. And in these size ranges: condenser and heat exchanger tube $\frac{1}{2}$" through 2" O.D.; boiler tube $\frac{1}{2}$" through 3" O.D.; and mechanical tube — $\frac{1}{4}$" through 3" O.D.

Write for a copy of our new steel tube catalog today! WOLVERINE TUBE DIVISION of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

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★ positive, DROP-TIGHT shut-off

★ instant STICK-PROOF operation

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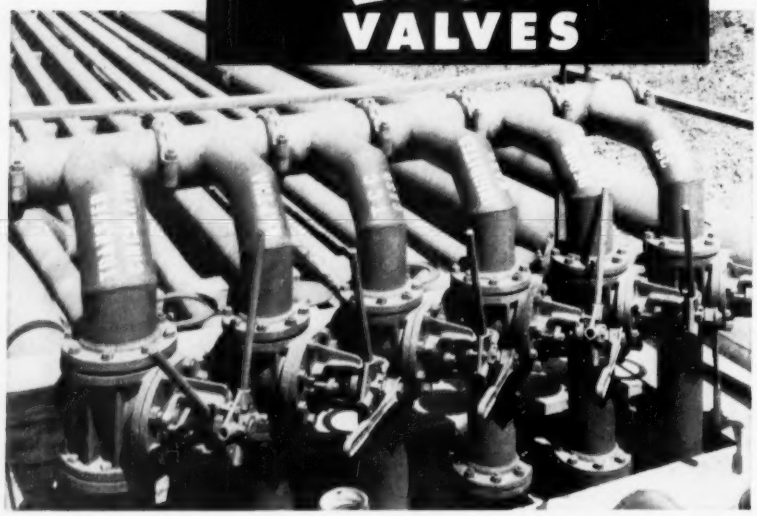
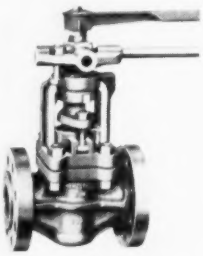
VALVES



Built right into every HOMESTEAD LEVER-SEALD VALVE is a powerful lever-and-screw device that either firmly seats the valve, or relieves seating pressure just enough to overcome friction and permit easy operation. For this reason, hard-to-hold fluids or extremes of temperature and pressure cannot cause a HOMESTEAD LEVER-SEALD VALVE to stick or "seize."

Instant, dependable operation, long service life, and extremely low maintenance cost are assured by this exclusive HOMESTEAD design. All vital operating parts and seating surfaces are protected from the corrosive or erosive effects of line fluids. No lubrication is required, but valve may be pressure gun lubricated if desired.



HOMESTEAD LEVER-SEALD VALVES are available in metals and alloys to specification; sizes 1½" to 12"; from vacuum to 1500 lbs.; temperatures from 40° below zero to 1100° F.

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sents Size Control Co., Chicago, precision gage manufacturer.

**Skurka-Langdon Engineering Co.,** Los Angeles, moved to 2847 E. 11th St., that city, to manufacture fractional horsepower motors and solenoids. Norris Skurka is president.

**Truck Body and Equipment Association Inc.** moved to 403 Washington Board of Trade Building, 1616 K St. N.W., Washington 6.

## ASSOCIATIONS

**Edgar H. Dix, Jr.,** assistant director of research, Aluminum Co. of America, received the Frank Newman Speller award of the National Association of Corrosion Engineers, Houston.

**J. E. Heuser,** engine division sales manager of Le Roi Co., Milwaukee, is new president of Internal Combustion Engine Institute, Chicago. Other officers are: Vice president, **B. G. VanZee,** chief engineer, Minneapolis-Moline Co., Minneapolis; secretary, **H. W. Smith,** consulting engineer engine division, Caterpillar Tractor Company, Peoria, Ill.; treasurer, **J. D. Cook,** secretary-treasurer, Hercules Motor Corp., Canton, O.

**Col. Leslie S. Fletcher** was appointed research fund director by American Society of Tool Engineers, Detroit.

**Jack L. Ware,** general sales manager, American Excelsior Corp., Chicago, has been named general chairman of the Ninth National Industrial Packaging and Materials Handling Exposition to be held late in September in Chicago. The exposition is sponsored by the Society of Industrial Packaging and Material Handling Engineers. **Walter J. Byrd,** Standard Brands Inc., New York and **Louis S. Beale,** Wirebound Box Manufacturers Association, will head the Packaging and Materials Handling short course. **Ray Mantz,** International Harvester Co., Chicago, is reappointed chairman of the National Protective Packaging and Materials Handling Competition.

the *elements* lose . . .

and *beauty* wins

with storm-and-screen doors of

**SUPERIOR** *Type* 430

**STAINLESS** strip steel

Lustrous, handsome, unaffected by exposure the year around, stainless steel storm-and-screen doors are the home-owner's perennial joy. • Built of Superior Type 430 Stainless Strip, these popular doors are the fabricator's delight as well, because our steel is made right, checked right, easy-handling at every step. Can we serve you?

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CARNEGIE, PENNSYLVANIA

A JONES & LAMSON CASE HISTORY ON COST REDUCTION IN THE CONTAINER MACHINERY INDUSTRY

# This is what happened at Benton Harbor . . . because three engineers attended a J & L Production Seminar

Saranac Machine Company supervisory and management personnel were informed by J & L's representatives of their continuing research in High Velocity Turning and decided to study the process. Three of their production supervisors attended a Jones & Lamson Production Seminar at Springfield during the Fall of 1952.

These men observed the sensational, actual production-line demonstrations and accumulated the facts concerning High Velocity Turning, resulting from J & L's research. They were convinced on the spot.

A year later, Arthur Yore, Saranac's master mechanic, reports: "We have increased speeds and feeds . . . are now turning at maximum spindle speed of 1500 RPM, feeds .015 to .025 on an average ¼" depth of cut on 1" to 2¼" diameter stock. This is about twice the speed we used before. We have done this on every machine in our factory that is powered and equipped to do it."

"Our turning tool life has increased 25% to 40%. All parts made by this method have a definitely better finish and higher degree of accuracy."

W. F. NEWHOUSE
*General Manager*
*Saranac Machine Co.*

PRODUCTION P.S. STUDIES

*J & L's findings on High Velocity Turning may be able to cut costs and improve production for your company. Investigate.*

**JONES & LAMSON MACHINE COMPANY**

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THREAD & FORM GRINDERS • OPTICAL COMPARATORS • THREADING DIES

STEEL

April 5, 1954

# Technical Outlook

**DEEP DRAWING ALUMINUM**— An aluminum enclosure for an aircraft carrier amplifier system measuring 14-5/16 inches long, with a 7-21/32 x 3-7/8-inch opening, is being drawn in 3 SO aluminum by American Aluminum Wear Co., Newark, N. J. Operation requires five draws with intermediate annealing and cleaning; the sixth operation is coining to final size.

**CUTTING OILY PLATES**— A thin layer of nonflammable dry chemical spread over area to be cut takes the hazard out of cutting oily steel plates. Ansul Chemical Co. says jobs where flames from the cutting torch heat the oil deposits to ignition temperature can be overcome because the flames are extinguished before they can get started.

**HEAT-RESISTANT PLASTICS**— Epoxy resins with a heat range of 350 to 500°F have been in research and development stages for the past year, according to Kish Resin Inc. At this time good physical properties can be attained at 350°F. But handling techniques must be improved before this resin can be released for general use. Broader heat range is expected to open a large field in heated matched molds, particularly for molded resin applications.

**MORE POWDERED METALS**— Investigations by American Brake Shoe Co. have led to a new type of product for the company—friction materials made of powdered metals. The process was turned up in the firm's search for new automotive brake lining fibers and bonds. Advantage of the technique is ability to produce unique combinations of properties that cannot be obtained in casting metals. Another firm, Keystone Carbon Co., reports a step forward in volume production of powdered metal parts. The company says new alloy steel powders are being molded into metal parts possessing physical characteristics previously available only in wrought steels. For example, parts made from grade Z-2 powder have ultimate tensile strength of 115,000 psi. with Rockwell C30 hardness.

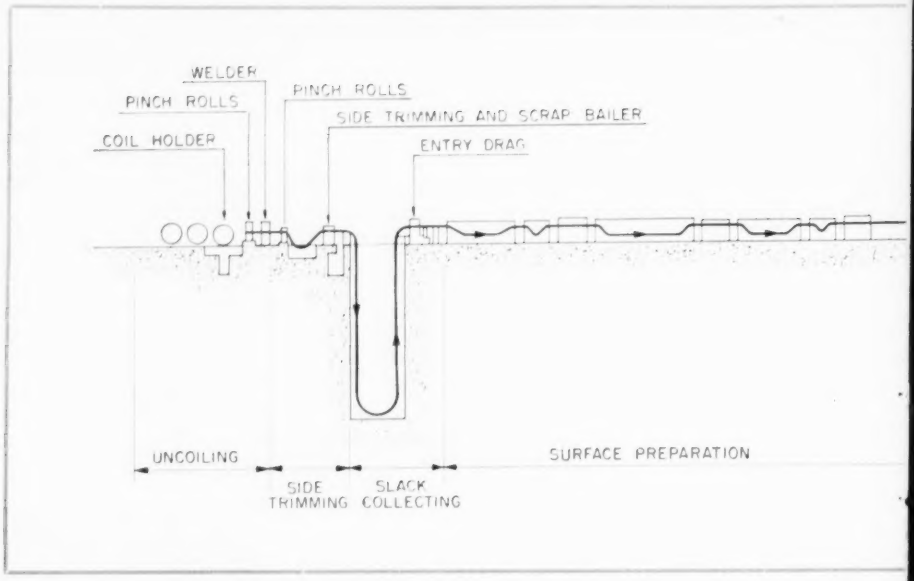
**INSTRUMENTS**— There is a hand tachometer that gives instant rpm readings on revolving shafts in ranges from 50 to 500 and 500 to 5000. By substituting a disc for the tips used for rpm, it also shows fpm. It's a product of Jones Motrola Corp., Stamford, Conn.

**READABLE DASHBOARDS**— Automakers may do well to look into an old aircraft technique to make dashboards more readable. Aircraft companies are using a sheet of lucite (3/16-inch thick), applying a coat of white vinyl paint and a subsequent black vinyl coat. Colored lights are inserted through holes in the back and light transmitted through horizontal planes of lucite. When numbers are scratched through exterior surface of the black vinyl, light shows through. Result is good readability, no glare.

**SYNTHESIS**— Hafnium carbide (one of the hardest materials) is probably a super-refractory compound. Hitch has been getting enough pure hafnium. It is similar to zirconium, making for difficult separation of the two elements. Oak Ridge National Laboratory synthesized hafnium carbide from carbon and pure hafnium oxide. Pellets of dry-pressed carbon and hafnium oxide were heated in a graphite crucible from 2000 to 2400° C for two hours, then for 5 minutes over 3000° C to volatilize impurities and increase crystal size by recrystallization. Product is a loosely coherent mass of blue-black crystals.

Metalworking Outlook p. 49 Market Outlook p. 161

By D. A. McARTHUR
A. R. GEISZLER
JOHN UPTON JR.
Wean Engineering Co. Inc.
Warren, O.




# New Angles For The Galvanizing Line

**PART I**

**Molten zinc is kept at operating temperature in a ceramic-lined pot that is heated by induction. Deep-sea diver was called in to help make round looping pits**

This is the first of two articles on the new line. Article in next week's issue of STEEL will describe electrical controls.

CONTINUOUS strip galvanizing line over 500 feet long has just been put into operation at Wheeling Steel Corp.'s Martins Ferry plant. Line speeds vary from 50 to 300 fpm.

Coils of steel strip that weigh up to 30,000 pounds are the starting point. Widths range from 18 to 36 inches; thicknesses from 0.012 to 0.60 inches. After cold reduction, initial preparation of strip may include any combination of cleaning, box annealing and continuous annealing and temper passing. Material also may be full hard.

End product is Softite, galvanized steel strip in coils up to 30,000 pounds or cut pieces from 3 to 14 feet long. Adherence is excellent in either light or heavy coatings.

**Over-all View**—In common with other continuous strip processing lines, this one is divided into three sections that can be operated independently and have strip storage means separating them. Each section has a looping pit 50 feet deep, which handles one free loop of strip. Of course, it is important to maintain constant speed through the processing section.

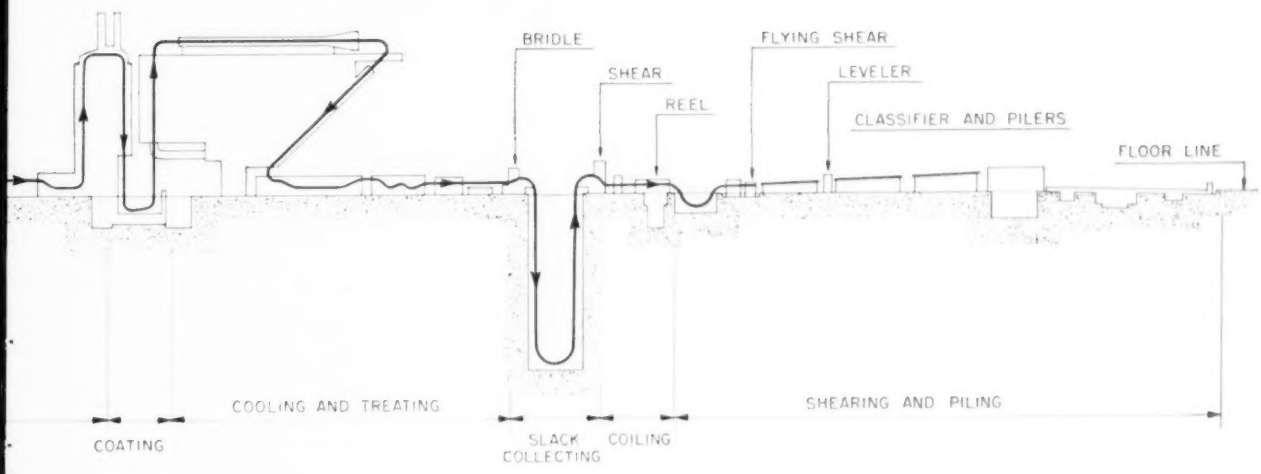
Entry section has uncoiling, joining and side trimming equipment; processing section includes all surface preparation, coating and final treatment apparatus; exit section contains coiling, shearing and piling equipment.

**Entry Section**—Here the line includes: Entry storage ramp, loading coil car, blocker roll station, air shear, coil holder, pinch rolls, seam welder with built-in shear; welder pinch rolls, side trimmer and miscellaneous deflector rolls and support tables.

Coils are stored on the entry ramp. They roll to the coil car by gravity. Coil car lifts them, traverses and then deposits them on blocker rolls, which are motor driven. Here rolls are unwound enough to permit the leading end to be cut by the air shear.

Preliminary preparation of the strip's leading end reduces joining time in the welder. Only one coil holder is used because of ample strip storage in the looping pit—but speeds already attained by the line indicate two coil holders might be a profitable investment.

**Welding, Scrap**—After the leading end of the coil is sheared, it is rewound by driving the blocker rolls. When the coil holder is




empty, the coil car raises the prepared coil and loads it on the head. At the same time, the trailing end of the preceding coil has been stopped, clamped in the welder and cropped by the welder shear. New coil is fed into the seam welder and the two ends are joined. Welder pinch rolls then feed the continuous strip into a shallow looping pit preceding the side trimmer, which permits centering the strip through the trimmer.

Side scrap goes into a scrap tunnel directly beneath the side trimmer, then into a trough that leads to a scrap baler in a scrap pit adjacent to the operating line. Side trimmer knives feed the strip into the entry looping pit.

**Looping Pits** — The 50 footers are made of reinforced concrete and are circular. They were installed by a modified, open dredge, caisson method.

Circular, prefabricated steel forms (17 feet tall) were installed in excavations about 9 feet deep. A monolithic pour of concrete was made, with a cast-in cutting edge and sealing lip at the bottom. After curing, forms were removed and taken to the second pit area, where the process was repeated.

While the top of the second pit was being poured, inside of the poured section of the first pit was excavated. Section was lowered by its own weight until its upper portion was about 9 feet below floor elevation. In lowering, movement of the section was constantly checked by transits to insure proper final location. Each looping pit was built in this manner in three operations, making walls about 54 feet deep.

Normal river pool stage at Martins Ferry is about 35 feet below the floor line of the mill. Control of water was a major problem during construction. So a deep sea diver sealed concrete slabs 4 feet thick under about 17 feet of water to insure tightness. Sump pump runs less than once a week.

**Processing Section** — Here the line may be subdivided into surface preparation, coating and finishing sections. There is also strip propelling equipment—drag bridle at the exit end of the entry looping pit for back tension on the strip and a drive bridle at the exit end of the processing section.

Gage stand following the entry drag bridle includes a contact thickness gage and pinhole detector. With the use of a suitable time delaying mechanism, these instruments operate markers mounted at the drive bridle.

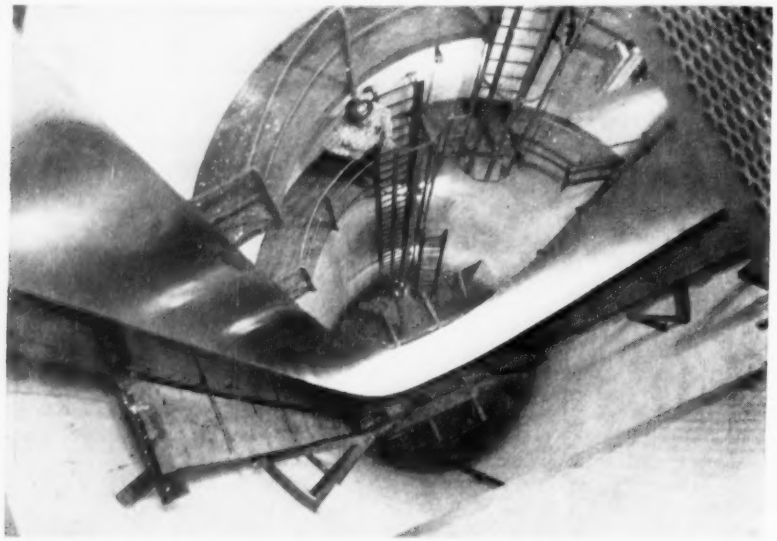
Pinhole material (marked with clearly visible ink) is deflected into the reject pile by the inspector. Off-gage material is marked with invisible ink that is spotted by a black light at the inspector's station.

**Preparation**—Line has several tanks (containing acid or alkali) and scrubbing brushes for each side of the sheet. Surface preparation may vary a lot, depending on previous treatment after cold reduction and the particular cold mill on which strip was reduced.

Application of flux from an aqueous solution is the last item of surface preparation. Uniform spreading and thickness of the flux are regulated as the strip leaves the application tank. Then flux is dried and the strip is preheated by a specially-designed conduction system. Strip passes through conduction system vertically.

**Galvanizing** — Molten zinc is kept at operating temperature in a ceramic-lined pot. Induction heating units are used. Induction heated pot was designed, engineered and installed by Ajax Engineering Corp., Trenton, N. J. Sink rolls and coating rolls guide the strip through the bath.

Zinc is premelted in a smaller, induction-heated, ceramic-lined pot next to the coating pot. Molten zinc from the melting pot flows through an electrically-heated runway into the coating pot. Zinc in-



This circular looping pit is 50 feet deep. Because it is below river level, a diver sealed off floor

gots are fed into the melting pot by a conveyor.

After leaving coating rolls, strip travels vertically. It is contacted on both sides by blasts of cooling air—to prevent zinc pick-up before contact with the first roll. Forced cooling is continued (first horizontally, then vertically) until strip reaches a spot near the floor. At this point temperature is measured continuously for proper cooling control.

From here strip runs horizontally through several chemical treating, rinsing and drying facilities which can be varied for the product desired.

**Exit**—Here galvanized strip is recoiled or sheared into sheets. Recoiling section has a drag bridle, air shear, strip edge scanning device and a tension reel. Drag bridle supplies tension to the strip for recoiling and is a driving unit that feeds strip over the tension reel on a by-pass conveyor and into a loop when shearing.

Air shear cuts strip at the end of a completed coil. Tension reel shifts automatically, as directed by the edge scanning device, which gives a straight-edge coil. Reel is provided with a hydraulically-operated coil car to remove the completed coils from the coil holder to the unloading position.

A shallow loop directly precedes the shear, to permit centering of the strip through the flying shear. The shear is equipped with a flattening stand. Its primary function is accurate feeding of material into the shear head.

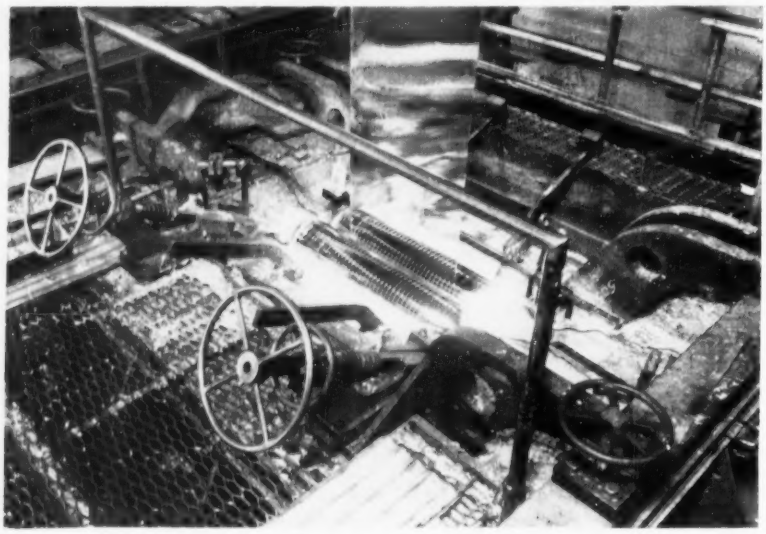
Following the shear is a belt conveyor that separates sheets prior to piling. This belt runs somewhat faster than the material running through the shear, making a gap between the sheets that are cut.

**Windup**—Sheets are next finished leveled by a small roll, backed-up leveler to get commercial flatness. Following leveling is a second belt conveyor, which is the station for the inspector. The function of the inspector is to control final destination of sheets.

Marked sheets with pinholes, marked sheets of off-gage material, sheets with lapped weld and sheets with questionable appearance are deflected into the reject piler. All others pass over the reject piler and into a hydraulically-operated prime piler. Piles are stacked squarely in the prime piler; as the pile gets higher, the lift is lowered until the desired size of pack is completed.

A staggering device is an interesting feature of the piler. Any predetermined number of sheets in a pack may be piled. Packs are alternately staggered lengthwise automatically.

Completed packs are lowered to floor level and released to be discharged on a gravity conveyor—lift platform of the piler is its first section. Scale with a conveyor brake in the center of the gravity conveyor indicates and records the weight of the discharged pack. Conveyor stops, in the discharge conveyor (before and after the scale), control movement of completed packs on the runout conveyor.

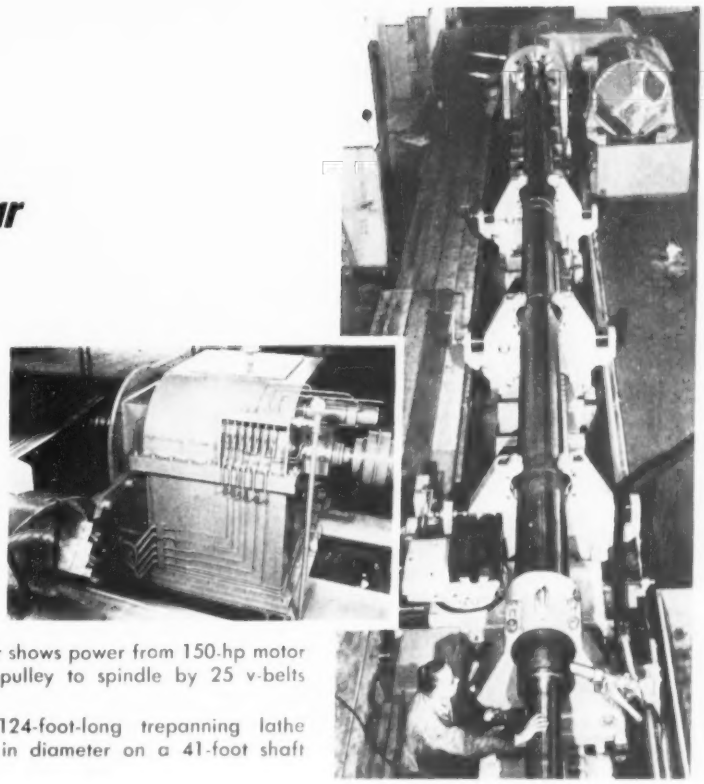


Close-up of the induction-heated pot and the coating rolls. Smaller induction unit is used for premelting

# TREPANNING

## *Quick Shift to High Gear*

**National Supply went from an improvised setup to this special device. It means adequate horsepower to spindle, high spindle speed range and high cutting fluid pressures**



Closeup of speed increaser shows power from 150-hp motor transmitted from driving pulley to spindle by 25 v-belts

National Supply Co.'s 124-foot-long trepanning lathe works a bore 3½ inches in diameter on a 41-foot shaft

A SPEED-INCREASING device that permits a quick shift between low and high-speed range is an essential feature of a 124-foot-long trepanning lathe developed at National Supply Co.'s Torrance, Calif., plant. The lathe is used in the industrial products division for work requiring high-speed deep-hole precision boring.

Penetration rates in excess of 4 ipm on a 5½-inch diameter hole, 26 feet deep, are commonplace. Holes up to 8⅞ inches in diameter, in lengths over 40 feet, also have been trepanned successfully at the Torrance operation. For a normal setup, workpieces up to 50 feet long may be trepanned.

**Method**—The trepan head, a cylindrical device with cutting tools projecting axially from the face at one end, is attached to a tubular boring bar of appropriate length. This drives into the revolving workpiece, producing an annular groove. Width of the annular groove and wall thickness of the boring bar are such that two annular spaces are formed—one between the outside of the boring bar and the inside of the workpiece hole, the other between the inside of the boring bar and the outside of the core.

Cutting fluid, under high pressure, enters through a gland and seals against the side of the workpiece. Traveling in the space between the outside of the boring bar and the inside of the hole, cutting fluid picks up chips and flushes them back through the space between the inside of the boring bar and the outside of the core. Chips are caught in a container at the boring bar's discharge end and coolant returns to the sump.

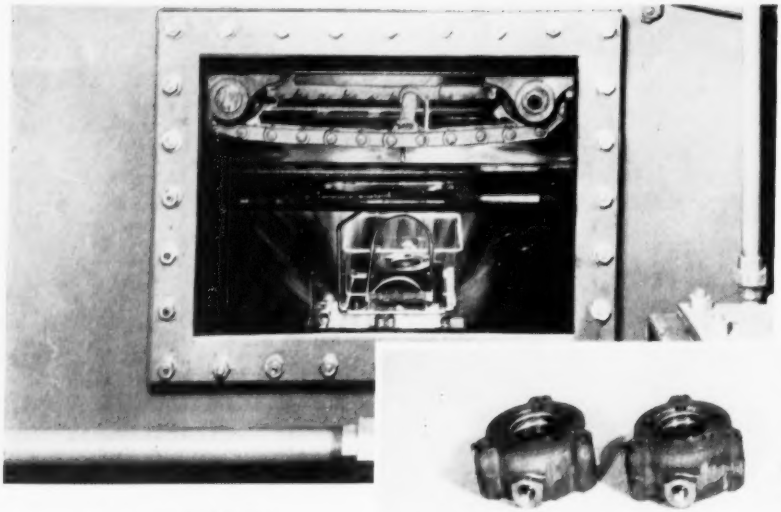
**Speed Ranges**—The power of a 150-hp variable speed direct current motor is transmitted to the headstock and workpiece through a two-speed gear box and a multiple v-belt drive. In the high-speed range—250 to 1000 rpm—the motor is coupled through the gear box in direct drive to the driving pulley. For low speeds, the power is transmitted to the driving pulley through helical gearing in the gear box, resulting in a 70 to 280-rpm speed range.

An air-actuated cylinder, located in the gear box and controlled by a three-position selector on the operator's side of the machine, permits the shift between high and low speed ranges into neutral.

Power is transmitted from driving pulley to spindle by 25 v-belts, size D. Spindle and spindle pulley are an integral unit carried in two tapered roller bearings—a double row at the chuck end and a single row at the opposite end.

**Centering Workpiece** — A quick-acting, self-centering steady rest facilitates centering the workpiece with the spindle's axis. Two opposing jaw elements, employing a common adjusting screw with right and left-hand threads, center the workpiece. Each jaw element carries four ball bearing rollers—two below for support and two above to restrict.

Cutting fluid is delivered from a 2000-gallon sump by a four-stage centrifugal pump located in a basement below the machine.



Hydraulic valve bodies being cleaned sonically. Two on left are shown before cleaning; the other two after

By T. J. KEARNEY
*Chief Engineer*
Detrex Corp.
Detroit

# Cleaning Metal with SONIC WAVES

**Transducers convert electrical energy to ultrasonic energy which vibrates cleaning solution. Difficult soils in hard-to-get-at locations are readily removed**

HOW can you clean the inside of a hypodermic needle?

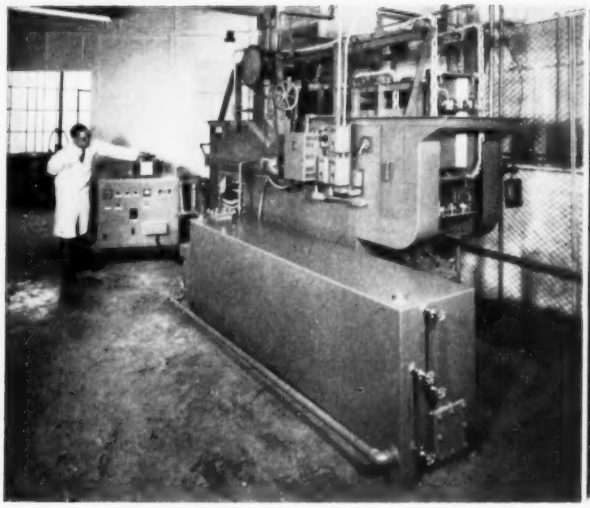
Many manufacturers are finding out that ultrasonic cleaning will handle this and other tough jobs. The principle is simple: Parts are immersed in a cleaning solution that is vibrated (through agitation and/or cavitation) by high frequency sound waves above the audible range of 20,000 cps. Results are similar to hand wiping because of the direct impact of the solvent on surface soils.

Process will clean non-absorbent materials, such as metals, glassware and molded products. Soils made by compounds for grinding, polishing, lapping, honing, buffing and drawing are readily removed —especially those in cavities, indentations, slots, small holes and the interiors of small bores.

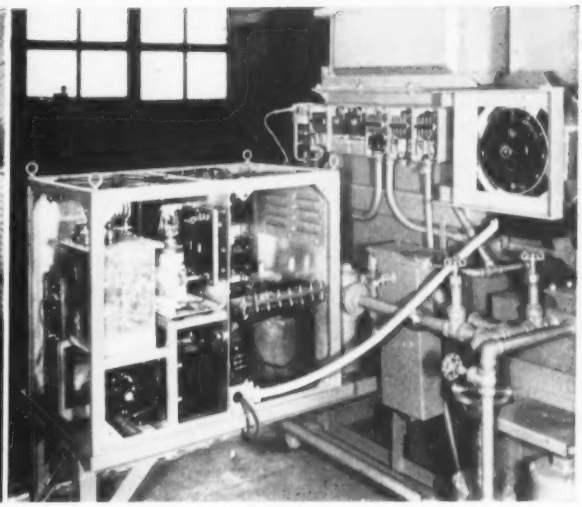
In fact, wherever cleanliness is at a premium, the system can be put to work on a continuous production basis. It is used, for example, to clean precision-lapped, automatic transmission parts of aluminum, aluminum die castings and cast iron; all parts of hermetically-sealed refrigerator compressors; piston rings, carburetor and fuel injector parts; and precision ball bearings.

**Equipment** — One system, the Detrex(R) Soniclean process, teams up ultrasonic energy with a chlorinated - solvent, vapor - degreasing cycle. Sound waves are produced by treated barium titanate transducers (they convert electrical energy into ultrasonic energy). Rf generators up to 5 kw are used.

Of the many ways of producing ultrasonic waves, the most common are magneto-strictive and piezo-electric oscillators. Former change dimensionally by molecular re-arrangement when the strength of the magnetic field in which they are placed is varied. Materials include iron, nickel, cobalt and their alloys.



This conveyorized machine is used for production test cleaning of work samples. Hoods and guards are removed



Interior of the Soniclean generator and controls. The generators range from 0.75 to 5 kw and larger

Piezo-electric effect is the vibration of crystals (quartz or a ceramic mass, such as barium titanate) when subjected to high frequency electrical potential. Conversion of electrical energy to sound energy by magneto-strictive devices is accepted as being less efficient than piezo-electric transducers.

Excellent motion-voltage characteristics ($190 \times 10^{-12}$ M./v) of barium titanate make it particularly suitable for use with present ultrasonic power generators. Its low electrical impedance means that transducers can be powered with potentials of less than 240 volts. It is possible to obtain physical motion with the material about 80 times greater than quartz.

Barium titanate can be formed in curved or trough-shaped sections. Resulting focal region, sound intensities make cleaning possible in a matter of seconds. By using focused devices, high acoustic intensities can be obtained, while operating at conservative watt densities on the face of the transducer.

**How They're Made**—Transducers in the Soniclean process are chiefly barium titanate in the tetragonal crystalline state. It is mixed with additives, such as clay or bentonite, to make the mixture easier to work. Material is then pressed into shape and fired at elevated temperatures to form a dense ceramic material. Metallic coatings are applied to two sides of the material.

Transducers are then activated by polarization. High voltages are shot between the coatings on the sides of the transducers at elevated temperatures. Specific voltages produce a permanent polarization, resulting from charges on the crystal interfaces.

By arranging transducers of standard sizes in multiples, wide design flexibility is provided. Energy can be beamed in any desired direction in the solvent bath.

**Power**—The generator used incorporates a bridge-type rectifier, using a mercury vapor tube, power oscillator, tuned circuits and necessary controls and protective devices. With the unit, the incoming line is supplied through a powerstat, then through a circuit breaker to a line contactor.

Tube filaments and control circuits are energized through transformers off the main line. The alternating current line voltage is transformed by the rectifier section into direct current power used to operate the oscillators.

The oscillator tubes, with the tank capacitor and inductance coils, make up the oscillator section, where the rf power is generated. Power is then fed through an impedance matching transformer to accurately match impedance of transducers. Matching is of prime importance in converting electrical to sound energy.

Generators come with power outputs of 0.75 to 5 kw and larger. All conform to JIC standards, the National Electric Code and NEMA requirements. Circuitry and cabinet construction of the Soniclean generator also comply with Part 18 of the Rules and Regulations of the Federal Communications Commission.

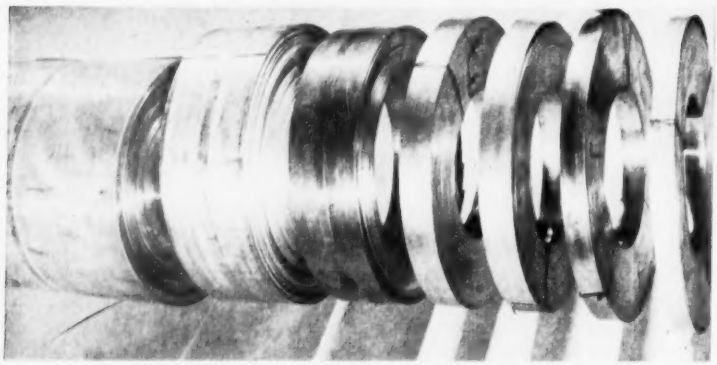
**Precautions** — To get best results, the process has a continuous solvent distillation cycle to remove oil, and filtration equipment to remove solids from the solvent.

Using chlorinated solvents, it is commercially practical to clean every piece of work with a final spray of filtered distillate and provide a pure vapor rinse and rapid drying.

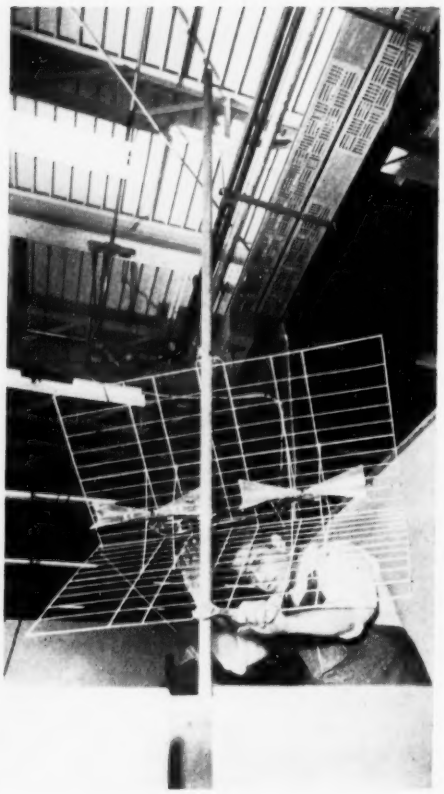
Process is safe, and work is removed clean and dry. It cannot be recontaminated with soils once removed.

**Sizes** — Crossbar and monorail conveyorized Soniclean equipment is available in sizes to handle trays and baskets of parts up to 24 x 14 x 8 inches deep. Production rates of 120 racks per hour can be handled readily.

Management reduced number of gages used from 20 to five. Cuts from standard coils are carefully planned



Six cuts fill the need for 12 sizes, which range from 7/16 to 3⅛ inches. The scrap loss is slight



Chain of events that led to production of this antenna was started by order to the supplier to slit stock

# Plan for saving dollars

**Television antenna maker combines advantage of buying standard-sized aluminum coils in mill quantities and base widths with warehouse storing and processing**

THEY'RE squeezing extra mileage from aluminum strip at Channel Master Corp., Ellenville, N. Y., a big television antenna maker.

By combining the price advantage of buying in mill quantities with warehouse storing and processing, company has achieved "tangible savings in dollars and intangible savings in service." Scrap loss on full mill coils is now less than one per cent.

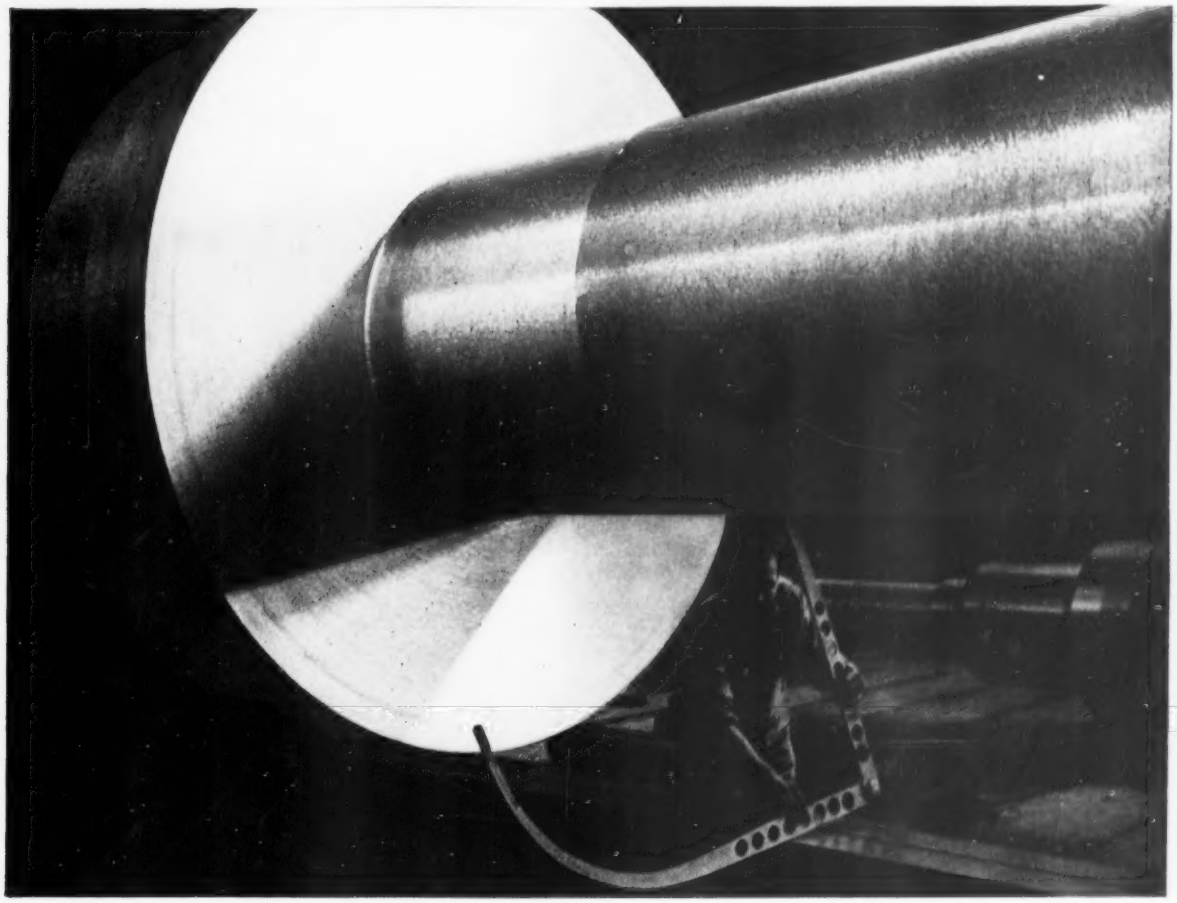
Today's complex rooftop antennas require aluminum in a variety of sizes. At one time Channel Master used 20 different gages; gradually this number was reduced to five. Strip fabricated ranges up to 0.080-inch thick, with 0.032-inch thickness the volume item it's used for tubing.

**Difference** — Normally a company buys its stock from rolling mills in widths needed for fabrication. Working with Eastern Brass & Copper Co., New York, Channel Master decided to buy standard sized mill coils n base widths and use Eastern's precision slitting facilities to cut out desired widths in each gage. Grouping of cuts from standard coils solved the problem of keeping individual widths in stock.

Here's how the system works: Channel Master buys from the mill at base price and quantity in standard coil widths. Eastern is mill destination point, warehousing and processing the metal as needed. Channel Master inventories in more than carload quantities, releasing it for processing as needed, to fit production schedules. Material is processed into form ready for fabrication and delivered—all within 48 hours—to Channel Master or its fabricators in the New York metropolitan area.

**Dividends**—Sufficient quantities are always on hand for emergency conditions or for financing. Out-plant stockpiling saves in-plant storage space and cuts handling.

Close tolerance slitting achieved not only insures against jam-ups in fabrication but also results in more usable strip per coil because of low scrap loss. Taking 22 cuts on a 24¾-inch coil of 0.032-inch stock, Eastern says standard loss is only 0.190-inch.



# SHAPING THE SHAFT THAT TAMES WATER POWER

Product — shaft for hydro-electric generator
Overall Length — 22'8¾"
Flange Diameter — 80⅛"
Body Diameter — 34½"
Weight — 100,600 lbs.

When a hydro-electric turbine is built it must last for scores of years. That is why leading builders of this equipment come to Midvale regularly for shaft forgings.

This large 22-foot shaft being given the final check is an example of Midvale production. Exact in metallurgical specifications because of the experienced steel making practices and complete open hearth and electric furnace facilities to fit the job. Carefully forged by hands with years of forging skill on presses from 1,500 tons to 14,000 tons capacity. Heat treated in temperature controlled furnaces to assure stability of structure throughout the shaft with the best combination of strength and ductility. Then machined to final dimensions on lathes especially designed for this type of work.

This is the reason Midvale forgings — whether 300 or 300,000 pounds — are noted for their long service and never failing performance. The men of Midvale working with the right equipment and facilities offer a source of forgings, steel mill rolls and rings unsurpassed in quality and extra performance. Let their service, long experience and willingness to solve your problem help you.

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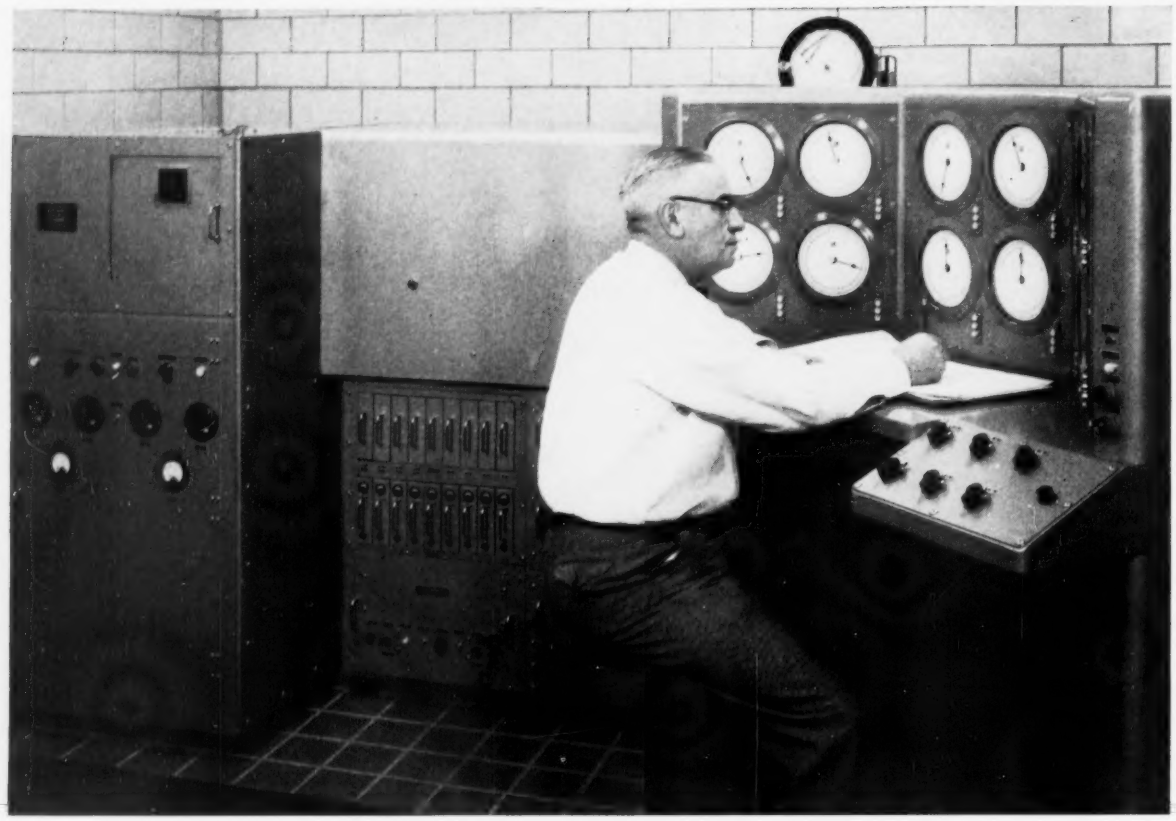


Scrap segregation and recovery is of vital importance to tool steel producers like Latrobe. Fast checks during melting also keeps this lab busy

# Spectrometer Vital For Tool Steels

**That's what Latrobe Steel thinks, and you can hardly disagree with them. They work constantly with nearly 100 different grades out of a possible 250 total**

TAKE a look at most installations of spectrometers in the steel industry and you'll see them running test after test on pretty much the same kinds of samples. Not so at Latrobe Steel Co., Latrobe, Pa. Their Baird unit keeps tab on some 80 to 100 grades of steel.

Main task of the spectrometer, installed in Latrobe's labs in 1952, is to test melt samples from the company's five electric furnaces, measuring metallic content

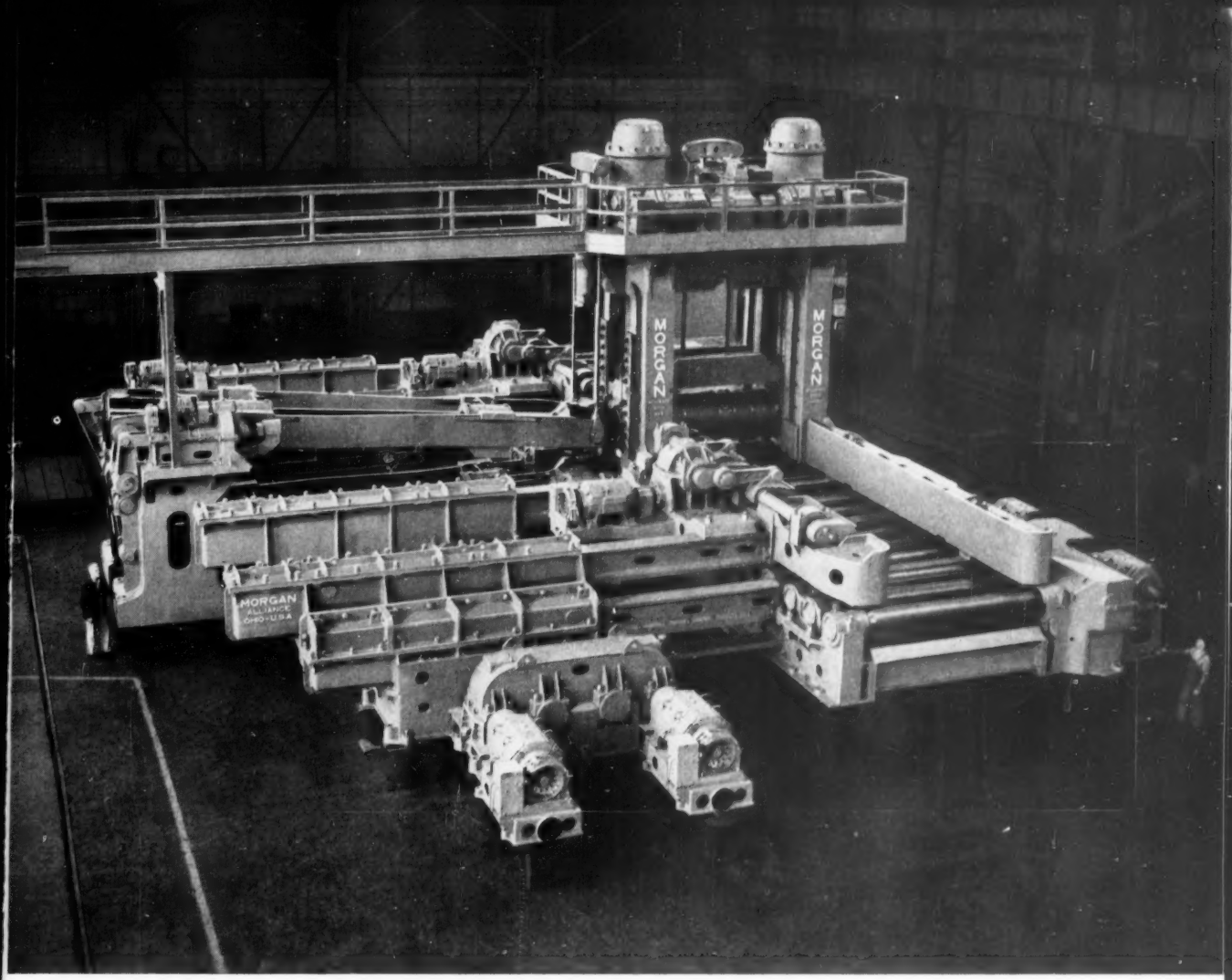
**Quality Vital**—Since its installation, the Baird spectrometer has become an important phase of the quality control measures practiced at Latrobe, according to W. W. Clarke, their chief chemist.

Of vital importance, economically, to this producer is recovery and segregation of scrap, since this material accounts for as much as 90 per cent of the charge to the electric furnaces. Analysis of scrap is the first function performed by the spectrometer at Latrobe — chemical determination of the basic raw material used by tool steel producers.

**Work Together**—Accurate melting to a customer's specifications demands accurate quality controls and extremely close co-operation between the chemical laboratory and the melt shop. At Latrobe, the bulk of production consists of 80 to 100 grades of steel, although as many as 250 types may be poured. With such a wide variety of steel analyses, considerable care must be exercised to meet the required chemistry of a heat.

During melting operations, the spectrometer really pays off, according to Mr. Clarke. Tests of melt samples which formerly required 75 to 90 minutes of a six to eight-hour heat now require about 20 minutes by using the spectrometer. Power savings alone can trim as much as 15 per cent from total cost for each heat.

**Quick Testing**—During furnace




**44" TWIN MOTOR DRIVE BLOOMING MILL**

Morgan 44"—2 High Reversing Blooming Mill to be direct connected to two 4000-Hp., 50/120 Rpm. Motors. Top roll and both spindles are hydraulically balanced by individual cylinders connected to an air hydraulic system. Speeds of motor driven screw down, feed rollers, mill tables and manipulator are regulated by variable voltage control.

Mill tables have box type cast steel girders. Rollers are forged steel equipped with anti-friction type bearing cartridges. All gears have hardened teeth, are totally enclosed and operate in oil. Manipulator is of the electric overhead type with retractable heads affording maximum accessibility to all parts of the mill tables.

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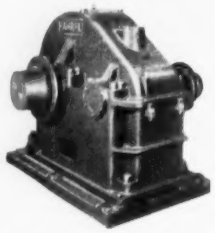
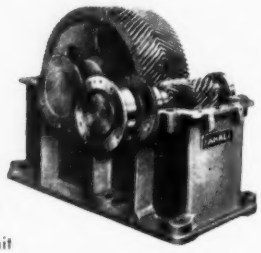
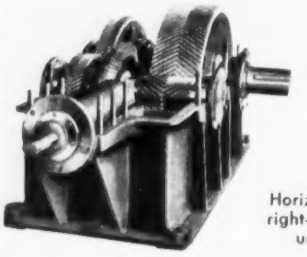
# THE SPEED REDUCER *Most likely to Succeed* IN YOUR PLANT



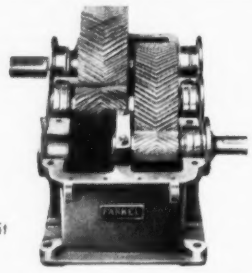
Heavy-duty single reduction unit



Standard single reduction unit



Horizontal right-angle unit



Standard double reduction unit

Farrel speed reducers start out with a better chance in life.

To begin with, the gearing in a Farrel speed reducer has teeth generated by the famous Farrel-Sykes method—a process that assures accuracy of tooth spacing, profile and helix angle. The herringbone design provides evenly distributed pressure over each tooth, from tip to working depth line. This means that there is no tendency for the teeth to wear unevenly and thus shorten the life of the gears.

Unlike most "standardized" products, Farrel speed reducers are standard only in their principal features. They are adaptable in critical detail.

The gears and pinions can be proportioned to meet specific load, speed and service requirements. Input and output shafts can be varied in size, in material and in extension. Housing dimensions can even be changed to meet problems in mounting.

For more about these adaptable units write for a copy of bulletin 449.

**FARREL-BIRMINGHAM COMPANY, INC.**
**ANSONIA, CONN.**

*Plants:* Ansonia & Derby, Conn., Buffalo, N. Y.
*Sales Offices:* Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

*Farrel-Birmingham* ®

FB-869

SOMETHING NEW!

SEE PAGE 123

heats, samples are taken directly from the furnace by means of evacuated glass tubes. These tubes disintegrate upon quenching, and the clean steel pin that each contains is sent by pneumatic tube to the spectroscopic laboratory. Here, in a room where temperature and humidity are rigidly controlled, the sample is prepared for testing. Temperature is 72 F and humidity 40 per cent. A variation of three degrees plus or minus will affect the results; an increase in humidity can cause leakage in the high voltage circuits.

Each pin is cut to a two-inch length and one end ground to a 170-degree angle. Then the pin is placed in electrode holders of the spectrometer and sparked. Latrobe is now testing for twelve elements with its spectrometer—silicon, chromium, tungsten, nickel, manganese, vanadium, tin, molybdenum, cobalt, copper, aluminum and titanium. Carbon, sulphur and phosphorus determinations are made by other means.

**Inside the Spectrometer** — Mr. Clarke explains that light from the analytical gap between test pins presses through lenses to an entrance mirror which reflects light to a diffraction grating. Light rays are sent back through photomultiplying tubes. Current generated there flows into condenser draws which discharge by means of a trigger circuit through the dials of "clocks" which register presence of each element.

To check the machine's operation, tests of metallic standards are made in the spectrometer before and after each melt test. As Mr. Clarke states, "Its value depends upon its accuracy which in turn depends on accurate analysis by ordinary laboratory methods."

**Premium on Precision** — While speed is an important factor, accuracy is far more important to a steelmaker basing his reputation on his product's high quality. Only a slight inaccuracy could cause scrapping of an entire heat an expensive procedure for a tool steel producer. This explains why Mr. Clarke believes spectrographic analysis offers far greater economic advantages in analysis and quality control of high alloy steels than it does when used by the producer of carbon steels.

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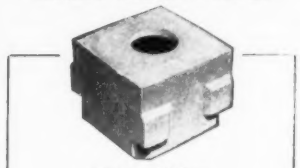
INGOT MOLD PLUGS



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1 Inland Steel Company's No. 3 Open-Hearth Shop was designed and built by McKee in 1952. Capacity of the four furnaces is 750,000 tons annually with provision for future expansion.

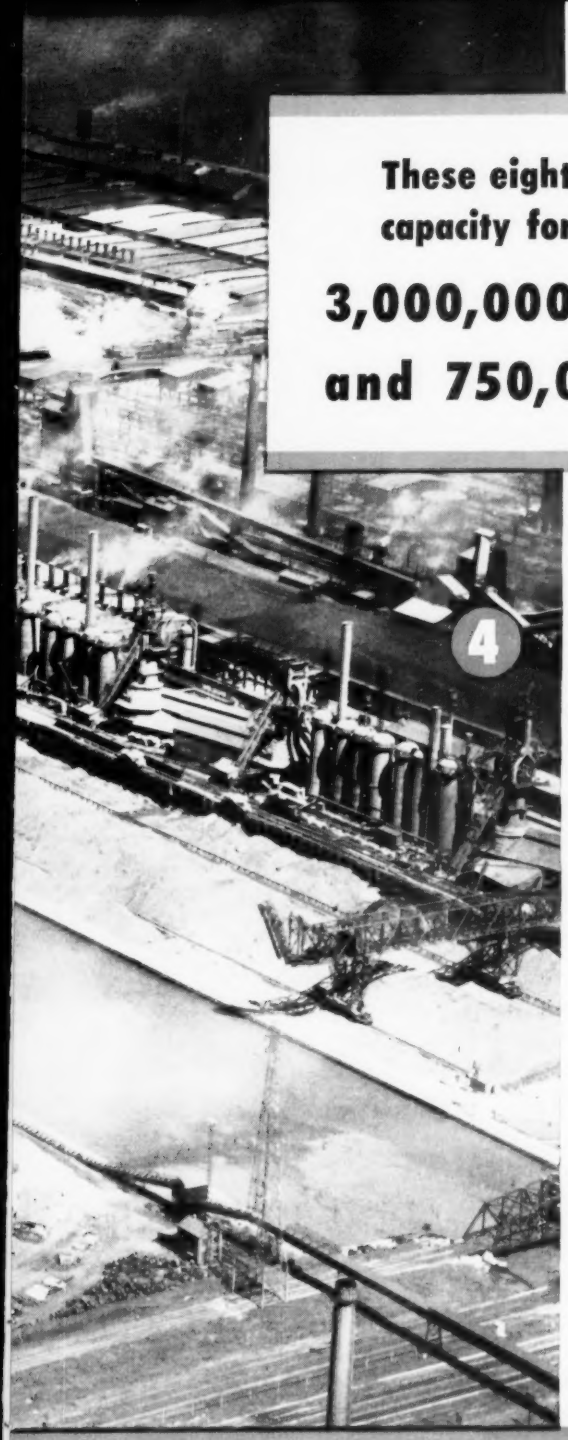
2 Inland No. 6 Blast Furnace designed and constructed in 1942 by McKee. With a 25′ 9″ hearth diameter, this furnace has a 450,000 ton capacity.

3 Inland No. 5 Blast Furnace, completed in 1938, was designed and built by McKee. Hearth diameter is 25′ 9″ and annual capacity 450,000 tons.

4 Inland No. 1 Blast Furnace was completely dismantled, redesigned and rebuilt by McKee in 1939. Annual production capacity is 300,000 tons. No. 1 Furnace has a 20-foot hearth diameter.

5 Youngstown Sheet & Tube Company's No. 3 Blast Furnace was completed in 1953. Designed and constructed by McKee, this furnace has a 28-foot hearth diameter and an annual capacity of 550,000 tons.

6 Youngstown No. 1 Blast Furnace, completed in 1948, was designed and built by McKee. Capacity is 480,000 tons annually, hearth diameter 26 feet.



## These eight McKee-built plants have capacity for the annual production of

# 3,000,000 TONS OF PIG-IRON and 750,000 TONS OF STEEL

HERE, in a relatively small area, are eleven blast-furnaces and an open-hearth shop. Seven of the blast-furnaces and the four-furnace open-hearth shop were designed and constructed by Arthur G. McKee & Company. This is a typical cross section of the iron and steel industry in the last 20 years because it graphically portrays the fact that McKee has built more blast-furnaces than any other single organization.

The combined annual capacities of these McKee projects add up to more than 3,000,000 tons of pig iron and 750,000 tons of steel. They add up to experience, too—almost fifty years of experience that includes every detail of blast-furnaces, open-hearth shops, rolling mills, sintering plants and related facilities. No other engineering firm has this background of experience.

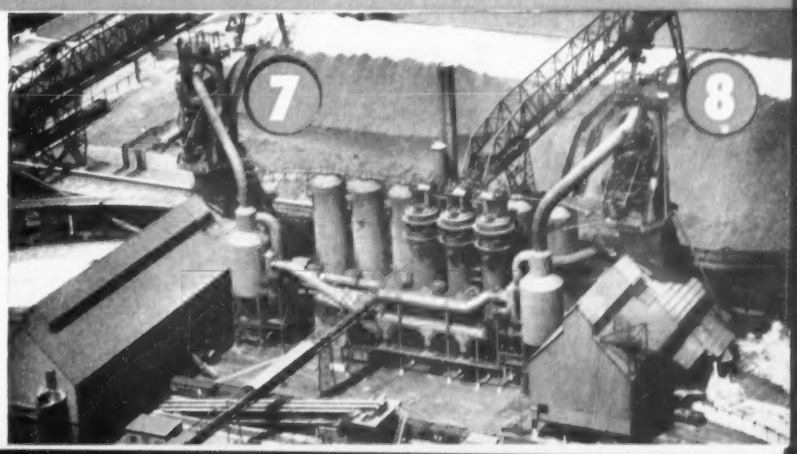
## McKee Engineering Services

**Arthur G. McKee & Company • Engineers and Contractors**

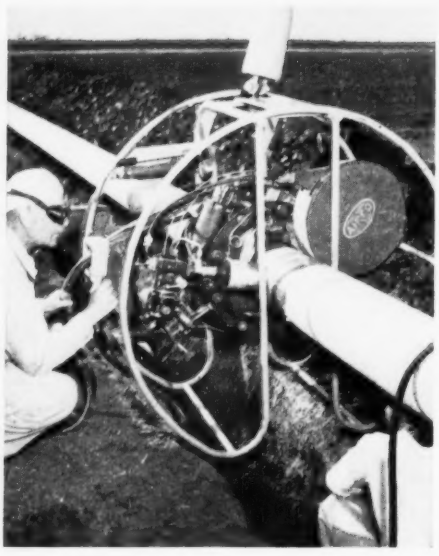
*Headquarters:* McKee Building • 2300 Chester Avenue • Cleveland 1, Ohio
*Offices:* New York • Tulsa, Oklahoma • Union, N. J. • Washington, D. C.
*British Representatives of Metals Division:* Head, Wrightson & Co., Limited
*Canada:* Arthur G. McKee & Company of Canada, Ltd., 350 Bay St., Toronto

7 Inland Blast Furnace A at Plant No. 3 has a 25′ 9″ hearth diameter and a capacity of 450,000 tons. Designed and built by McKee, it was completed in 1943.

8 Inland Blast Furnace B at Plant No. 3. Built at the same time as Furnace A, it has the same hearth size and capacity. These two furnaces form one of five sets of "twins" designed and built by McKee.



Welding unit is easy to handle in the field. Boom crane carries it from joint to joint as fast as welds are made



Unit itself includes clamping mechanism and the automatic Aircomatic head which circles the butted joint

# Automatic Welder

## FOR ALUMINUM PIPELINES

**Big deterrent to greater use of aluminum for high-pressure gas lines was difficulty of making sound field welds. This portable rig does it, and twice as fast**

A PORTABLE automatic welding machine, used during the laying of the longest aluminum pipeline ever installed, has performed so well that it passed the ditching machines and worked on ahead of them—a feat rarely accomplished in hand-welding operations.

The new machine is helping to lay the 12-mile high-pressure pipeline between the White Point gas field near Corpus Christi, Tex., and the Reynolds Metals Co. LaQuinta alumina plant. Developed by Reynolds in conjunction with Air Reduction Sales Co., the machine bids well to further the growth of aluminum pipelines.

**Time Halved** — Machine welds 40-foot sections of 8⅝-inch aluminum pipe in an average time of four minutes for a five pass weld, compared to about eight minutes or more for welding pipe in place by hand, the method commonly used for steel pipe and which heretofore has created technical problems in the welding of aluminum pipe.

Suspended over the line by a side boom, the automatic welder is equipped with quick-acting clamps which securely grip the pipe. Pressing a button starts the welding, and automatic controls maintain proper conditions at the arc. When the weld is complete, the machine automatically stops, reverses itself, and returns to the starting position. The clamps are then released, and the machine moves to the next weld.

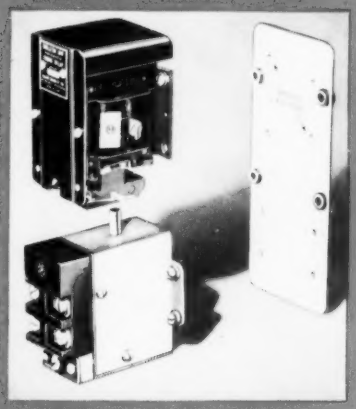
**Test 1800 psi**—The welds made during the laying of the 12-mile high-pressure link were subjected to pressure as high as 1800 psi and held firmly. The 40-foot aluminum pipe sections used weigh only 320 pounds while the same size section of steel pipe weighs about 1000 pounds. Reynolds technicians pointed out that this makes possible savings in handling, equipment and labor which virtually offset the higher cost of aluminum pipe.

Although pipe in the new White Point-LaQuinta line is wrapped, this is unnecessary in many instances. If aluminum pipe is wrapped, it does not require cleaning after storage to remove mill scale or rust. Wrapping of aluminum pipe therefore costs about 30 per cent less than for steel, it is estimated.

The line being laid near Corpus Christi is the first full-scale use of the newly-developed automatic welding machine. Short test lines with smaller diameter pipe were laid earlier at Listerhill, Ala., for the Alabama-Tennessee Natural Gas Co., and at Jal, N. Mex., for the El Paso Natural Gas Co. Both installations proved successful and made it possible to perfect the process.

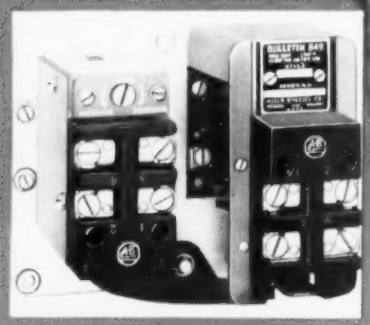
### BULLETIN 849 TIMING RELAY CONSISTS OF TWO UNITS

The solenoid operating unit and the pneumatic timing unit are mounted on a steel backplate.



### ON-DELAY OR OFF-DELAY

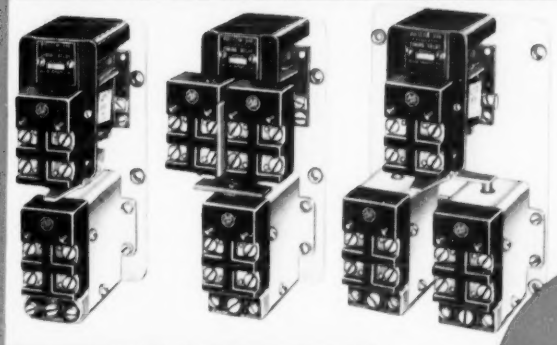
The timer may be arranged for ON-Delay or OFF-Delay. ON-Delay provides time delay when solenoid is energized; OFF-Delay provides time delay when solenoid is de-energized.



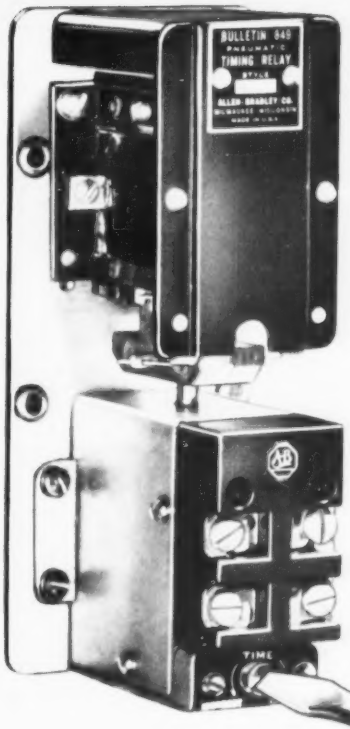
### HORIZONTAL CONSTRUCTION

Style ZAX Pneumatic Timer is available for applications in which the horizontal arrangement of solenoid and timing unit satisfies space requirements better than the vertical type.

### AVAILABLE IN MANY CONTACT COMBINATIONS



A great variety of contact arrangements can be provided for Bulletin 849 Timers, as shown in the illustrations above. Full details concerning contact arrangements furnished on request.




# BULLETIN 849 PNEUMATIC TIMING RELAY

***Solenoid Operated***

## EASY TO ADJUST

### for Timing Intervals from 10 Cycles to 3 Minutes

Here is a compact . . . easy to adjust . . . solenoid type pneumatic timer with quick make-and-break silver alloy contacts that operates with an accuracy of ±10% . . . irrespective of temperature, humidity, or vibration. Its wide timing range . . . from 10 cycles to 3 minutes . . . makes it the ideal timer for hundreds of industrial applications.

There are one set of normally open and one set of normally closed contacts. Additional contacts may be mounted on the timer frame and actuated by the same solenoid mechanism. Wiring terminals are all accessible from the front. Send for illustrated Bulletin 849, today.

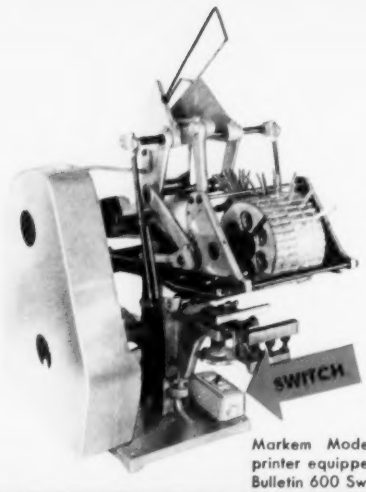
Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

A-B Quality

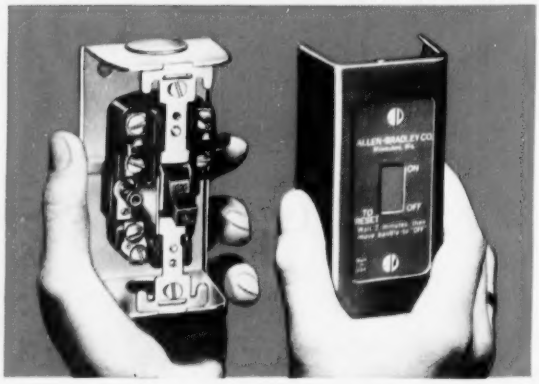
**ALLEN-BRADLEY QUALITY TIMING RELAYS**

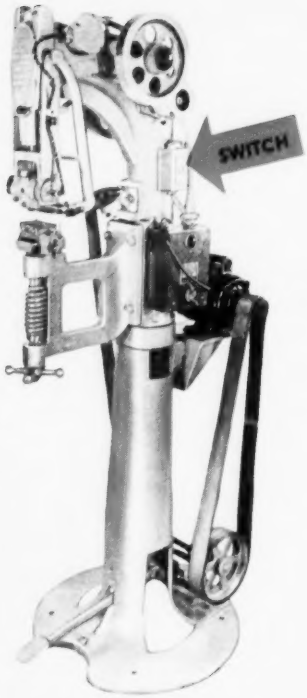
2.54-R

Markem Model 105 heavy duty box and label printer equipped with an A-B Bulletin 600 Manual Starting Switch.




Markem Model 45AC printer equipped with a Bulletin 600 Switch.






Markem No. 2 embosser for indenting and coloring on plastics, wood, leather, etc., with A-B Bulletin 600 Switch.

# SNAP SWITCH *with* OVERLOAD BREAKER FOR 1 HP MOTORS AND SMALLER

● Burnouts of small motors can often cause serious production delays. Therefore, dependable overload protection is absolutely essential . . . and for motors of 1 hp or less the Allen-Bradley Bulletin 600 Starting Switch is the logical answer.

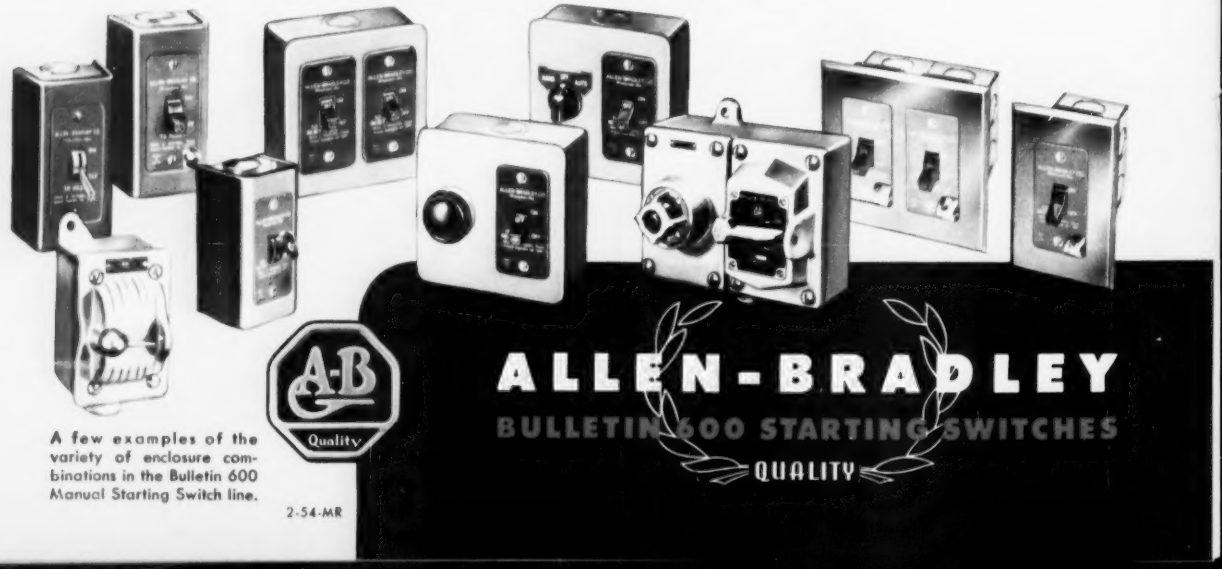
It has a built-in thermal overload breaker which trips the toggle switch in case the motor is overloaded . . . and you can't keep the switch closed until the overload on the motor is cleared.

The Bulletin 600 Manual Starting Switch is ideal for small a-c and d-c motors on space heaters, stokers, refrigeration compressors, fans, pumps, packaging machines, labelers, grinders, and other light machinery.

Available in open type construction and also in standard sheet metal enclosures, waterproof and weatherproof enclosures, and gastight enclosures for installations in hazardous gas locations.

Bulletin 600 Manual Starting Switches can be furnished in various auxiliary combinations—namely, with pilot lights, selector switches, and key and lever switches, as illustrated below. They will fit into standard conduit switch boxes if desired. The double break, silver alloy contacts need no attention. Bulletin 600 gives dimensions and other data.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.




A few examples of the variety of enclosure combinations in the Bulletin 600 Manual Starting Switch line.

2-54-MR

## Model Behavior

MODEL railroad trains are expected to give hundreds of hours of trouble-free operation without much in the way of expert attention. Lionel Corp., Irvington, N. J., manufacturers of toy electric trains and model railroad equipment, keeps this fact in mind in its efforts to improve its product and manufacturing procedures.

Lionel engineers report they are beginning to produce harder working parts—such as gears, pinions and collector rollers—in a special grade of Plast-Iron powder supplied by Plastic Metals Division,

IRON POWDER GEARS
*. . . miniature for miniature engineers*

National Radiator Co., Johnstown, Pa. Made by the electrolytic process, this type of powder is extremely pure and can be compressed to high densities under comparatively low compacting pressures.

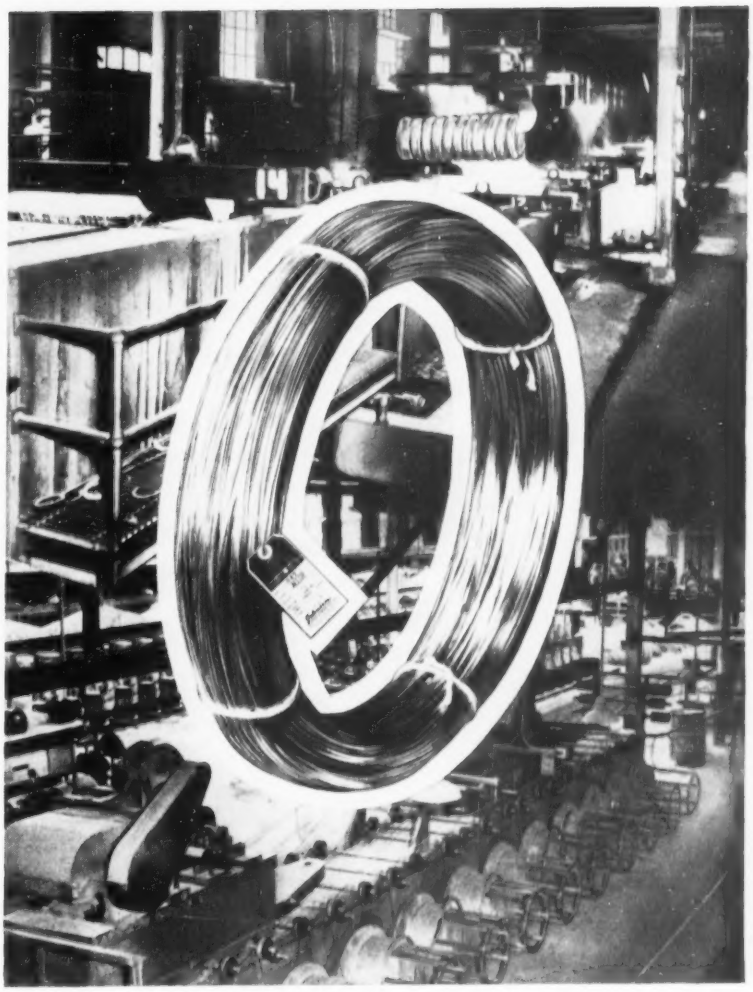
Thus, parts are tough and wear-resistant. Slight porosity remaining provides a lubricant reservoir for low-friction operation.

## Time Data Source

Handbook of Standard Time Data by Arthur A. Hadden, late president, and Victor K. Genger, vice president, of McClure, Hadden & Ortman Inc., management engineers, is a one-volume source for tested, detailed standard data needed in industry to establish machine shop time values.

Given are separate tables for each common type of operation.

The price is $10.00. Publisher is Ronald Press Co., New York 10.

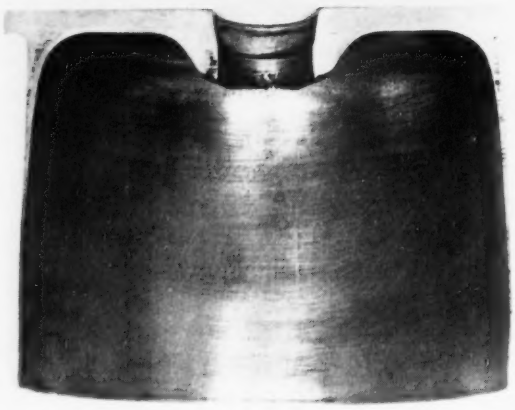



***Inflation: a cockeyed economic condition that makes the prices you get look good and the prices you pay look awful.***

Inflation has affected the wire making business just as it has all other industries. But the upsurge in the cost of raw material, handling, labor and everything else along the line has been to us a challenge. Here at Johnson, through improved manufacturing, we have been able to meet inflation part way, with the result that our high quality Music Wire, the largest manufacturing item in our specialized industry, has advanced in price less than many other commodities that have zoomed since jet planes passed speed of sound, approached speed of gossip.

**JOHNSON STEEL AND WIRE COMPANY, INC.**
WORCESTER 1, MASS.
New York Philadelphia Pittsburgh Cleveland Detroit Akron
Dayton Chicago Atlanta Houston Tulsa Los Angeles
A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

Spotwelding this industrial floor cleaner clutch is an easy way to get extra thickness, but still retain the advantages of stamping



This 4.5 howitzer case started with uniform material, but Presteel made thousands of these successfully on presses

**PROGRESS IN METAL STAMPING**

# A Quantity Producer Combats Its Limitations

**The stamping industry makes constant progress against its competitive limitations. Under concentrated attack are tool charges, thickness variations, sharp radii, tolerances**

By CARTER C. HIGGINS
*President*
Worcester Pressed Steel Co.
Worcester, Mass.

HISTORY of the stamping industry has been one of overcoming limitations. At present, the principal limitations can be stated as tool charges, variations in stock thickness, sharp radii, burrs and oil can effects, and tolerances.

Proper tool construction is the basis of all stamping work. Stampings that would be inexpensive if made from existing tools, will not be similarly inexpensive for limited production runs. Stamping tool charges for single parts may vary from $200 to $50,000. Thus, sometimes sheet metal fabrication by simple bedding processes is economical in readily-available stock tools. At other times, it is better to go to machined parts or to castings made from simple patterns.

**Combatting Tool Charges** — A number of efforts are being made by the stamping industry to combat high tool charges. Stock tools may be available. In the aircraft field particularly, plastic and zinc alloy dies—known as soft tools—are worked more easily and can produce tolerances close enough for limited runs of numerous parts. High cost of fitting punches into dies is eliminated by using sheet rubber punches or rubber dies in the Guerin process.

Hydro presses have rubber pads built into the press, which take on the shape of the punch attached to the bed and form the metal in between. The Marform process, the Hydroform press and the new Verson press development are all quite elaborate methods of using rubber, backed by hydraulic mechanisms to reduce tool charges and avoid scratches. Finally, note should be taken of short run stamping methods using steel cutting edges such as are used in cutting out paper forms.

**Stock Thickness**—Because many parts require bosses, heavy bases, etc., a second limitation on stampings is that we start with uniform stock thickness. Of course, the most simple way of achieving variations is by spot welding or various other methods of putting components on the basic stamping. Welding is more costly than stamping, so where there are marked variations in stock thickness, castings, die castings and powder metal formings are in order.

A cartridge case serves as an example of another type of thickness variation. The base may be $\frac{1}{2}$-inch thick, the mouth less than 1/16 inch. Here, the stamping process has been used to squeeze or pull metal through a smaller opening than its thickness. Within limitations of the metal's work hardening, which may require several operations to achieve desired shape with intermediate annealing, such variations can be gained with

Ski plate teeth are most economically and rapidly produced by this press coining them into the thickness of the metal

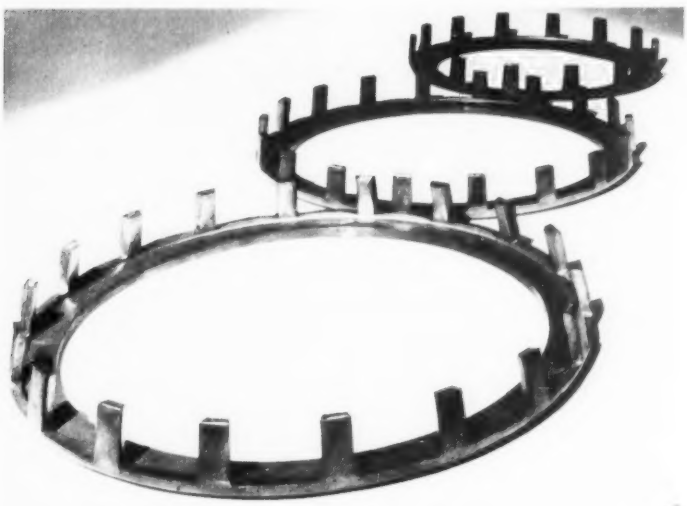
Flanged meter case must fit tight in container, making a grooved radius advisable, even with an extra operation

considerable effectiveness.

**Extrusion Techniques** — New cold extrusion methods offer particular promise along these lines, relying on forward extrusion where the metal goes ahead of the punch over a post inside the die, or backward extrusion where it crawls up the punch. Impact extrusion has been used for years on aluminum and tin; cold extrusion applicable to tin is now being developed for shell bodies that have been forged and machined.

Heavy coining can also produce thickness variations in bottom of drawn parts. The fact remains that stampings come from uniform stock and cost is increased when variations are called for. If it is necessary to go from 1/16 inch to $\frac{1}{2}$ or $\frac{3}{4}$ inch on the same surface, forging or casting is probably better.

**Sharp Radii, Burrs** — Sharp edges inside can be achieved. But there is a layer of metal thickness larger than the inside radius and not sharply defined without succeeding machining or coining operations. The move toward streamlining, with its rounded contours, is a reflection of the stamping process. Radii can be sharpened by forcing the metal within a confined area. In this respect, a radius has been forced sharp on the bottom outside a cartridge case. Here again a basic limitation on the stamping process is overcome.



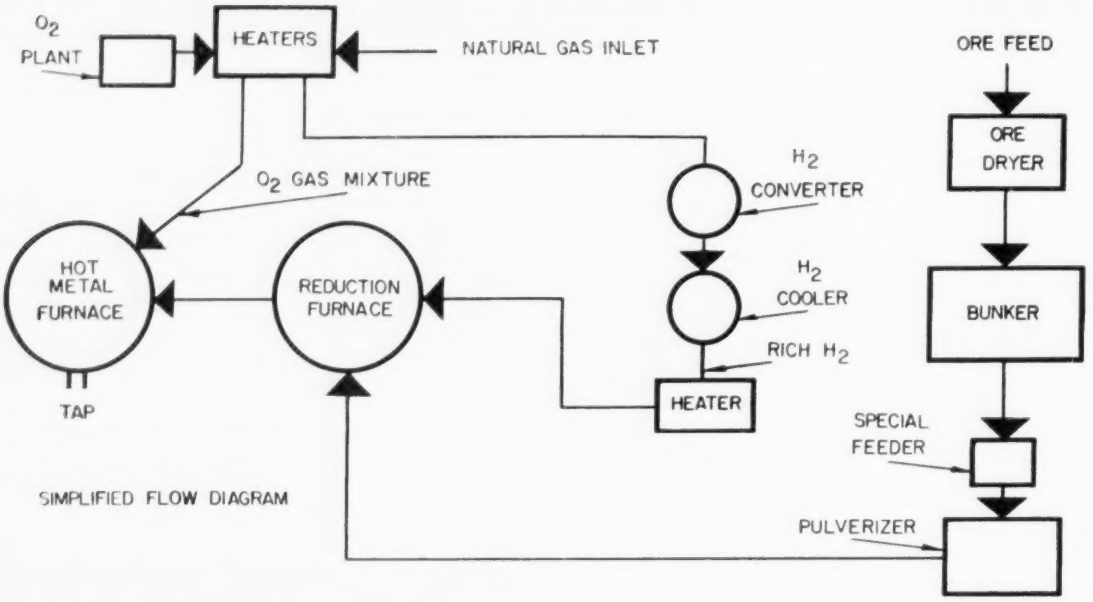
Impressing the rolled shape where the rollers go overcomes the rough edge and saves machining on these roller bearing holders

Also inherent in the stamping process are certain limitations that can be met but require hand work. For example, a piece of metal in shear is cut part way through by the tool and breaks the rest of the way, leaving a sharp edge which in some cases will have to be filed off.

The sheared edge is not a smooth surface. In fairly large square or rectangular boxes, metal at the corners is under compression and fills the die. But along the sides too much metal may tend to creep in, giving a depression like that observed in an oil can. This is very hard to avoid and even hand operations are not completely successful against such defects in light gage metal.

**Tolerances** — Finally, stamping can be handled to fairly close tolerances. Worcester Pressed Steel Co. works to limits of 0.002 to 0.010 inch or larger. Some companies work to even closer tolerances on fairly simple operations making parts for watches, instruments and motor laminations. Careful attention to tolerances, where needed, can achieve striking results compared with some other processes.

For instance, in machining, such tolerances are hard to inspect and costly to produce. Assuming that the original stock thickness will vary from 0.004 to 0.008 inch as rolled by the mill, closer tolerances are hard to get. Stamping tolerances are satisfactory for most such needs.




Above is a flow sheet showing various pieces of equipment used for handling and reducing fine iron ores

# OXYGEN PERFORMS DUAL FUNCTION

# . . . *in direct reduction process*

**Method devised for Venezuela producers of iron ore is applicable to fine ores in this country, especially where a supply of coke oven gas is available**

PRODUCTION of pig direct from fine iron ores without wasting heat to obtain nodules is the crux of a process recently developed by Frank G. Parker & Co. Inc., New York. The method was devised primarily for operation in Venezuela to reduce the fine ores which will be available from the screening operation at Cerro Bolivar and other ore deposits in that country, with the cheap natural gas available. The process also can be applied in those plants in this country where coke oven gas is available, or in other areas where ore must be pulverized for beneficiation. Here is how it works:

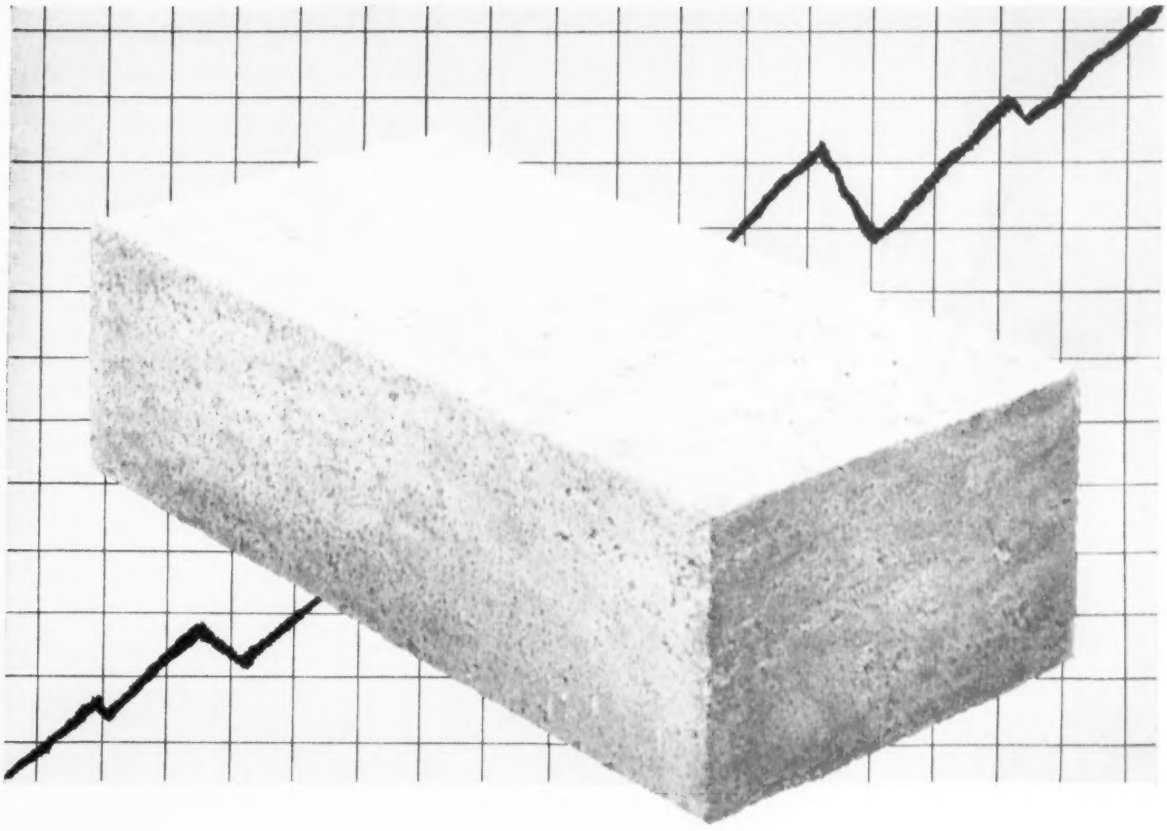
Ore passes from a suitable bunker into a dryer and is conveyed to a dry ore bunker of sufficient size and capacity for at least a 2-hour run of the pulverizer. Ore from the pulverizer is transported by air to a reduction furnace and reduced to iron. This is fed to the hot metal furnace at approximately 1600°F. This furnace is built with the usual iron and slag tapholes.

**Various Fuels Used** — Fuel employed is either natural, coke oven or a high Btu regenerative gas manufactured from bunker "C" fuel oil.

Latter type gas produced in a regenerative reverse flow unit will have a heating value of 1000 Btu per cubic foot. High-purity oxygen (95 per cent) and fuel gas are injected into the hot metal furnace at several points to heat the hearth and to maintain the proper CO ratio of the waste gas for further processing.

Waste gas is used for all reheating purposes, for the transfer of fine ores in the recycling circuit, for drying, for the production of power and steam, and to produce hydrogen required to reduce the ore to iron in the reduction furnace. High-purity oxygen is essential to maintain the necessary temperatures in the hot metal furnace; in the oxygen production the hydrogen which arises is used in the hydrogen cooler.

Equipment necessary for handling and reducing the fine ores is shown on the accompanying flow sheet. The waste gas recycling circuit can be rearranged to suit conditions demanded by certain specific types of ores. Temperatures indicated on the drawing may vary somewhat but they will not exceed plus or minus 100°F. The process also is applicable for the reduction of pyrites, coal brasses and other sulphite ores.



# INCREASE YOUR OPEN HEARTH BOTTOM LIFE

## WITH PERMANENTE PERICLASE BRICK!

WITH Permanente Periclase "D" burned brick as the subhearth under a Permanente 165 bottom you get *higher MgO per unit volume than possible with any other refractories available today.*

Permanente Periclase "D" bricks provide 9.43 lbs. of MgO per 9" equivalent, plus *maximum* density with absence of connected voids. Used in combination with Permanente 165 you are sure of the ultimate in bottom safety and durability.

---

Write for descriptive literature on (1) Permanente Refractory Brick, (2) Permanente 165, and (3) the companion ramming mix, Permanente 84.

Principal sales office: Chemical Division, Kaiser Aluminum & Chemical Sales, Inc., First National Tower, Akron 8, Ohio.

***Permanente Periclase Brick for the Steel Industry:***

**PD-B (Periclase "D"** burned) brick for open hearth and electric furnace bottoms. Low in iron, lime and silica. Chrome free. Maximum MgO in bottom.

**PCA, PCA-MC (Periclase-Chrome "A"),** plain and metal-encased for open hearth end walls, front walls and uptakes. Metal-encased for electric furnace sidewalls. High in MgO. Outstanding all-purpose refractory.

**CPA-B (Chrome-Periclase"A,"** burned) for open hearth front and back walls. Controlled chrome additives result in highest resistance to spalling.

**CPA-MC (Chrome-Periclase "A"),** metal-encased for open hearth back walls, front walls. **D** (Chrome "D" burned) for open hearth bottoms, soaking pits. High hot load strength.

**Installation advice on request**

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## Flexible Radiant Tunnel

FAR-INFRARED radiant heat is being used for precise preheating of engine cylinders on a conveyorized basis. Capital Airlines at Washington National Airport is utilizing the method for the precision job of installing shrink-fit parts in aircraft engines.

Other important advantages gained in changing from the former gas torch heating method include a 30 per cent increase in assembly production, a saving of 25 man-hours per week and cleaner, cooler working conditions for employees.

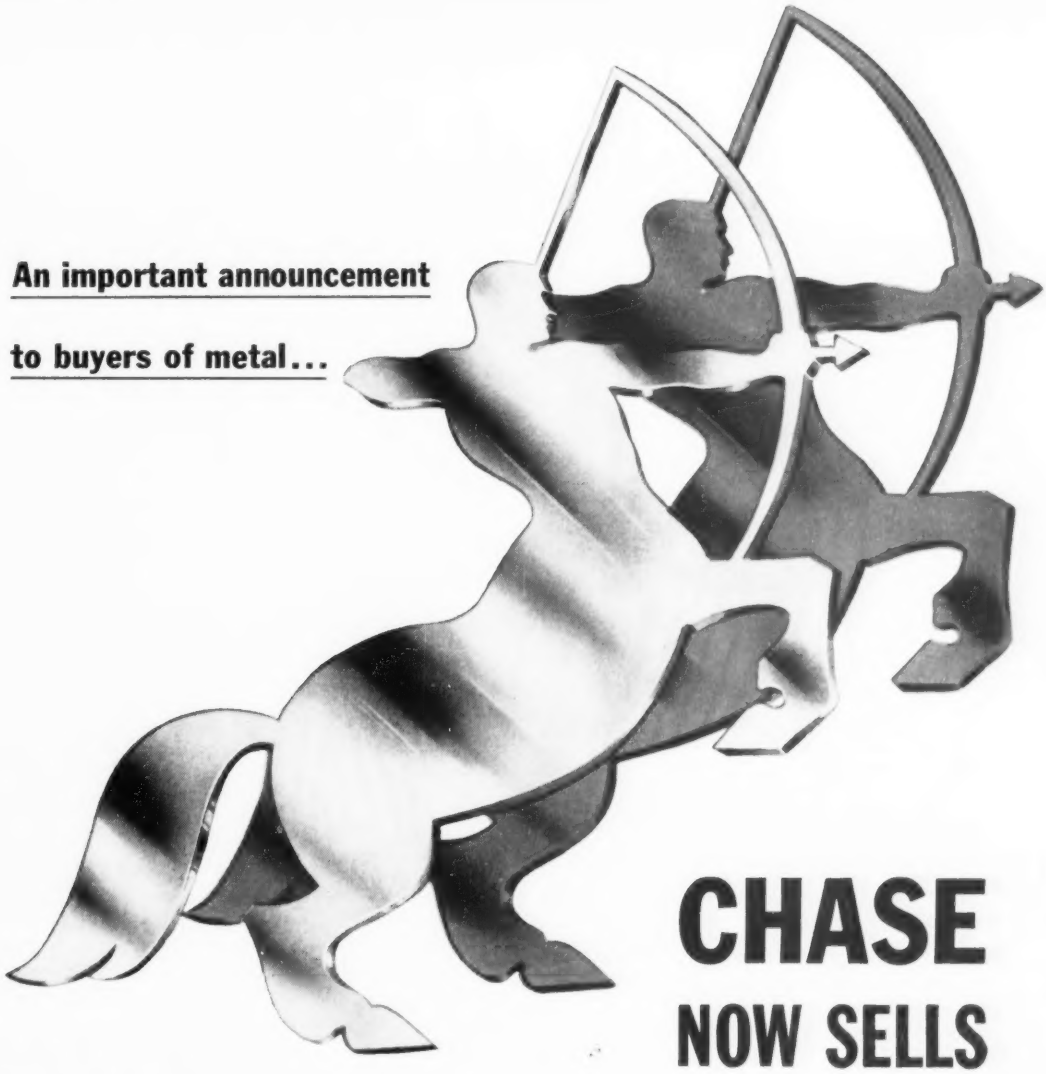
**Radiant Tunnel** — The flexible radiant tunnel responsible for these results has infinitely variable control and is readily adapted to handle several different types of cylinders for engines which Capital overhauls. The tunnel consists of six Chromalox electric radiant heaters rated at 3.6 kilowatts each, which are enclosed in an insulated shell and mounted on structural framing over the conveyor line. Radiant heat is concentrated on the valve opening areas of each cylinder, while reflective aluminum spacers, inserted between the heaters, increase radiant effectiveness and help retain convection heat. Far-infrared produced by the Chromalox radiant heater is readily absorbed by the aluminum cylinders.

CYLINDERS ON CONVEYOR
*. . . about to enter radiant tunnel*

The tunnel accommodates six cylinders at a time continuously. Correct temperatures for each type of cylinder are obtained by varying the setting of a percentage-type input controller. Maximum setting in any case is 75 per cent.

**An important announcement**

**to buyers of metal...**



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**He's ready to help** you reduce unproductive storage space and convert it into space that lets you do more profitable jobs. This will also reduce your raw material outlay, cut your handling and insurance costs.

**Your Kaiser Aluminum Distributor** is geared to meet your emergency needs, to go to work for you the minute you call. And, if you want to borrow on his experience, he can also specify the exact type of aluminum your product requires. He can suggest methods of using aluminum more economically. He can supply you with small quantities for experimental work.

**All these services** mean a load off your shoulders . . . and more profits because of lower costs. Why not call your Kaiser Aluminum Distributor today?

**Kaiser Aluminum**

**Your Kaiser Aluminum Distributor is listed at the right. See him soon!** ➡

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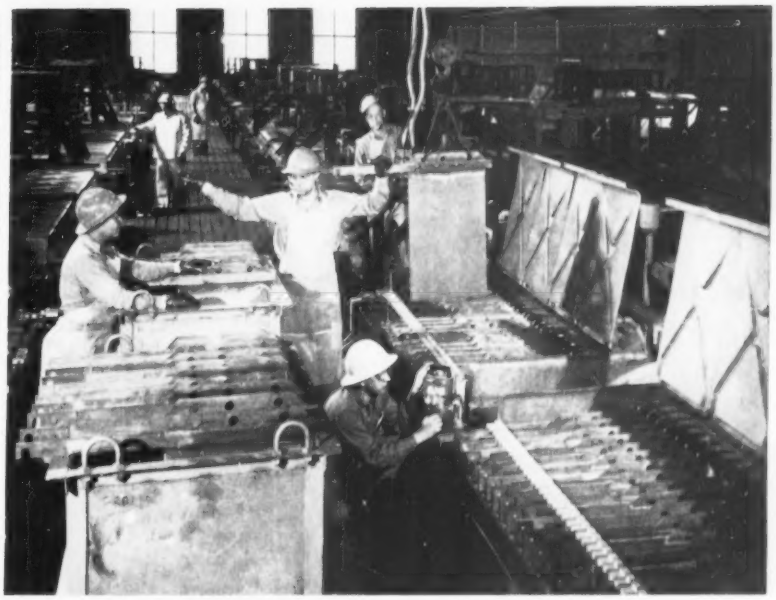


## Commercial Electrolytic Chromium Production Begun

Commercial production of electrolytic chromium has started at the Marietta, Ohio, alloy plant of Electro Metallurgical Co., division of Union Carbide and Carbon Corp. Output is expected to be about 2000 tons a year when plant is in full-scale production. New product will go mostly into special high-temperature alloys for jet engines, gas turbines and rockets

## Better Controls—More and Better Steel

EXISTING steel-making machinery can be modernized, with controls now available, to produce more metal of higher quality with less fuel, Buffalo Chapter members of Association of Iron and Steel Engineers were recently told.

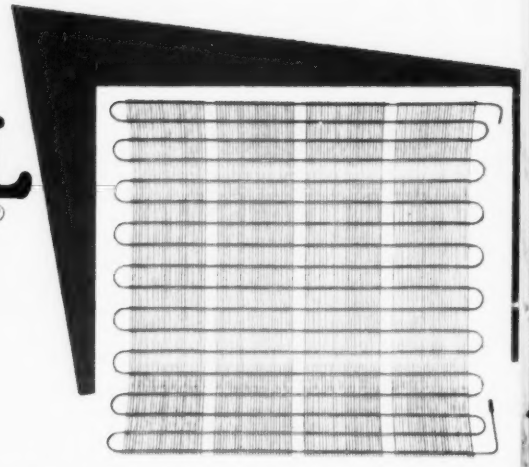
An automatic system for reheating ingots to be worked by continuous rolling mills in an East Coast plant was described by John R. Green, steel industry manager for the Industrial Division of Minneapolis-Honeywell Regulator Co. The method involves measuring temperatures, metering the flow of variable scrubbed coke-oven gas and oil, computing the needed thermal units and calculating what each heat source can best supply. Mr. Green stressed the fact that the calculations for this operation were done by off-the-shelf machines as well as they could have been handled by enormously costly electronic brains.

**Regenerative Soaking Pits**—The furnaces, where a newly solidified ingot is kept while being brought to uniform heat so that cooling stresses are equalized, are a prime example of the advantage of controls, according to Mr. Green. In a study of more than 100 pits in 10 different plants, it was found that heating time was reduced 30 per cent, heating was more uniform and an increase in the available heating area of 20 per cent, incidental to fitting controls, resulted in an increase in capacity of 50 per cent.

Advantages of controls are obvious to steel industry managers so much, said Mr. Green, that instrument sales have multiplied 10 times in the postwar modernization and expansion program. He added that this does not mean that the steel industry is an easy one for the instrument maker to serve. Everything in a steel mill is hot, everything is dirty; the worker is accustomed to making manual adjustments of anything that doesn't seem to be functioning. The ruggedness and simplicity necessary to make a control work under such conditions must be constantly preserved against the increasing accuracy of the measurements and controls that are insisted upon as steels become more and more specialized.

# Now... Condensers can be Made with 216 Simultaneously Fed Strands of

# CONTINENTAL® COIL WIRE



• By using Continental Coil Wire in exact specification, packed in the NEW Drum Container, 216 strands can be simultaneously fed into special high-speed welders to make condensers for the refrigerator trade. Such is the experience of the Seeger Refrigerator Company where Continental Wire specialists supplied not only the right wire, but also the right type of wire package—to do the job right.

*Photos courtesy of the Seeger Refrigerator Company*

**OUT OF NEWLY DESIGNED DRUM CONTAINERS**

## INVESTIGATE THE ADVANTAGES OF CONTINENTAL'S NEW DRUM TYPE COIL WIRE PACKAGE

- 580 pound catchweight coils of single length wire in this new drum container are ideally suited for a continuous feed operation.
- New drum packaging has reduced customer's machine "down" time by as much as 30%.
- New drum package eliminates handling of bare coils of wire.
- No tie wires to contend with.
- Drums are ideally suited for storage—they stack well.
- Excellent protection against rust or surface corrosion—wire is clean and bright when used.
- Wire does not have to be oiled for protection—no messy and slippery storage area.

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STEEL CORPORATION • KOKOMO, INDIANA

**PRODUCERS OF Manufacturer's Wire in many sizes, shapes tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.**

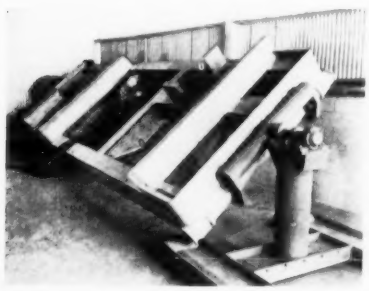
## Easier Cleaning, Painting

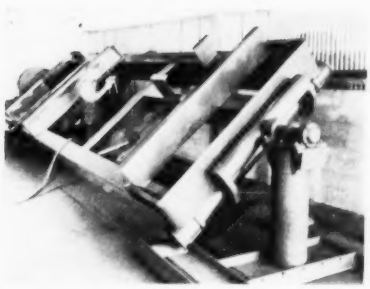
USE of a special manipulator, in conjunction with vacuum blasting and spray painting equipment, has facilitated cleaning and painting of large assemblies.

The manipulator, used by National Supply Co.'s Torrance, Calif. plant, is built in two sections. Supported between the sections, a workpiece can be rotated through 360 degrees to make every inch of it fully accessible for cleaning and painting. Power for rotating the workpiece is provided by an electric motor in one section of the manipulator.

**Holding the Workpiece** — Fixtures for holding the workpieces of various shapes and sizes can be quickly assembled to the manipulator. Portable, the manipulator can be moved to area where work is performed. Use of the equipment permits an assembly to be cleaned and painted in approximately 40 per cent less time than that previously required.

The blasting unit consists of a continuous cycle Vacu-Blaster, Model C-9, used in conjunction with a model D-5 dust collector. An aluminum oxide abrasive is used as a blasting agent. A workpiece can be cleaned at a rate of 1½ to 2 square feet a minute, depending on surface of material.





Supported in manipulator, frame for drilling rig is blast cleaned, then painted. All the parts are accessible

# You will Dump High Costs, too...

**when you install the Dempster-Dumpster System of bulk materials handling.**

Manufacturers over the nation have learned to eliminate the costly and inefficient method of handling bulk materials with conventional dump trucks, drivers and loading crews. You can equip one truck with a hydraulically operated Dempster-Dumpster. Then, inside or outside buildings at convenient accumulation points, you simply place detachable Dempster-Dumpster Containers, in capacities up to 4 times that of conventional dump truck bodies, with each designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. Containers shown at left, all handled by one Dempster-Dumpster, are only a few of the many available or that can be built to meet your needs. The Dempster-Dumpster, operated by only one man, the driver, serves scores of containers—one after another, as shown below.

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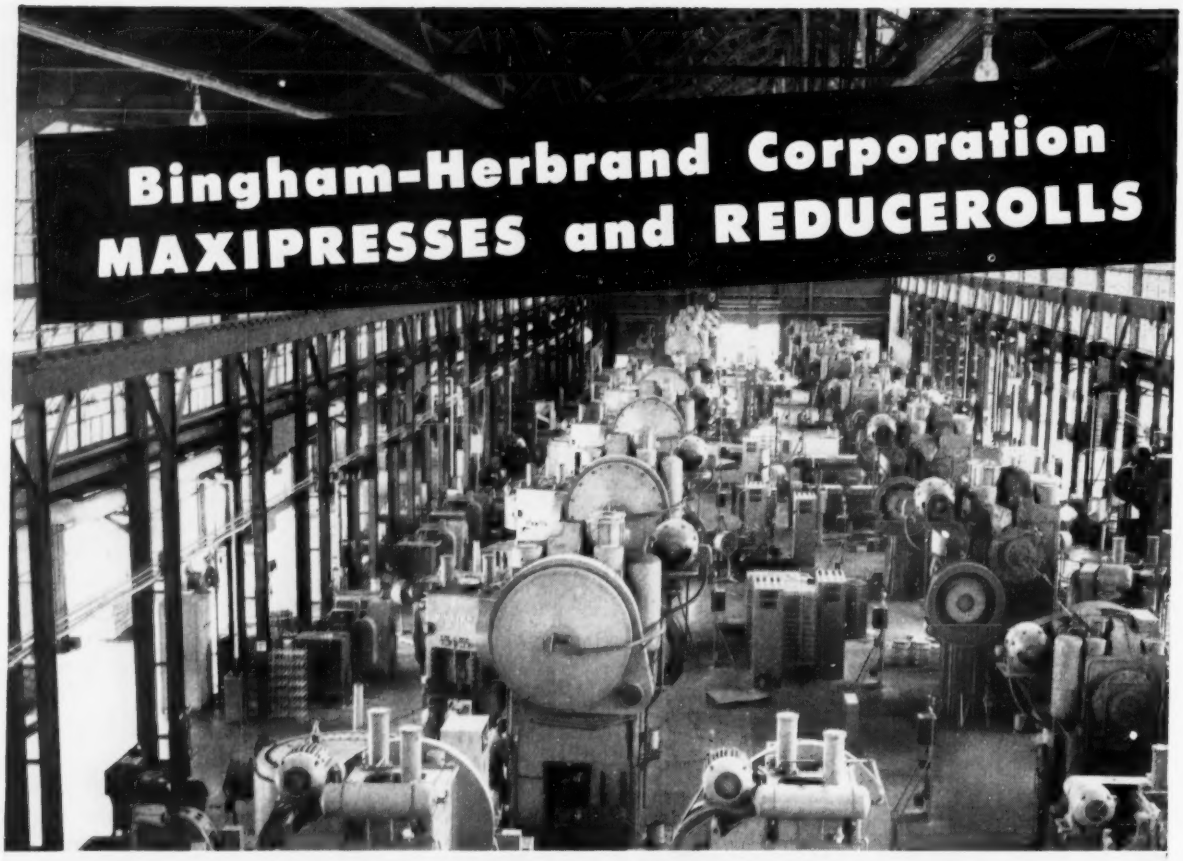
**DEMPSTER BROTHERS, 644 Dempster Bldg., Knoxville 17, Tenn.**




*THE 20th CENTURY FORGE SHOP at Bingham-Herbrand, Fremont, Ohio*

**The efficient and highly productive Aviation Division of the Bingham-Herbrand Corp., Fremont, Ohio, relies entirely upon National for its heavy forging equipment.**

**At full operating capacity, these Maxipresses and Reducerolls are capable of producing exceptionally large quantities of precision forgings every day! This primary forging equipment includes:**

**4 2500-ton Maxipresses**
**6 2000-ton Maxipresses**
**6 1300-ton Maxipresses**
**2 700-ton Extrusion Maxipresses**
**5 No. 6 Reducerolls**
**1 No. 4 Reduceroll**

**Among the reasons underlying Bingham-Herbrand's exclusive preference for Maxipresses and Reducerolls are:**

1. **Newest design to have been exhaustively proved in actual forge shop conditions.**
2. **Availability of National's continuing engineering assistance on die problems.**

**If you have a forging problem — large or small, hot or cold, ferrous or non-ferrous — let us help you solve it. Send us prints, or a sample part, or, better yet, visit us. No obligation.**

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**MACHINERY COMPANY**
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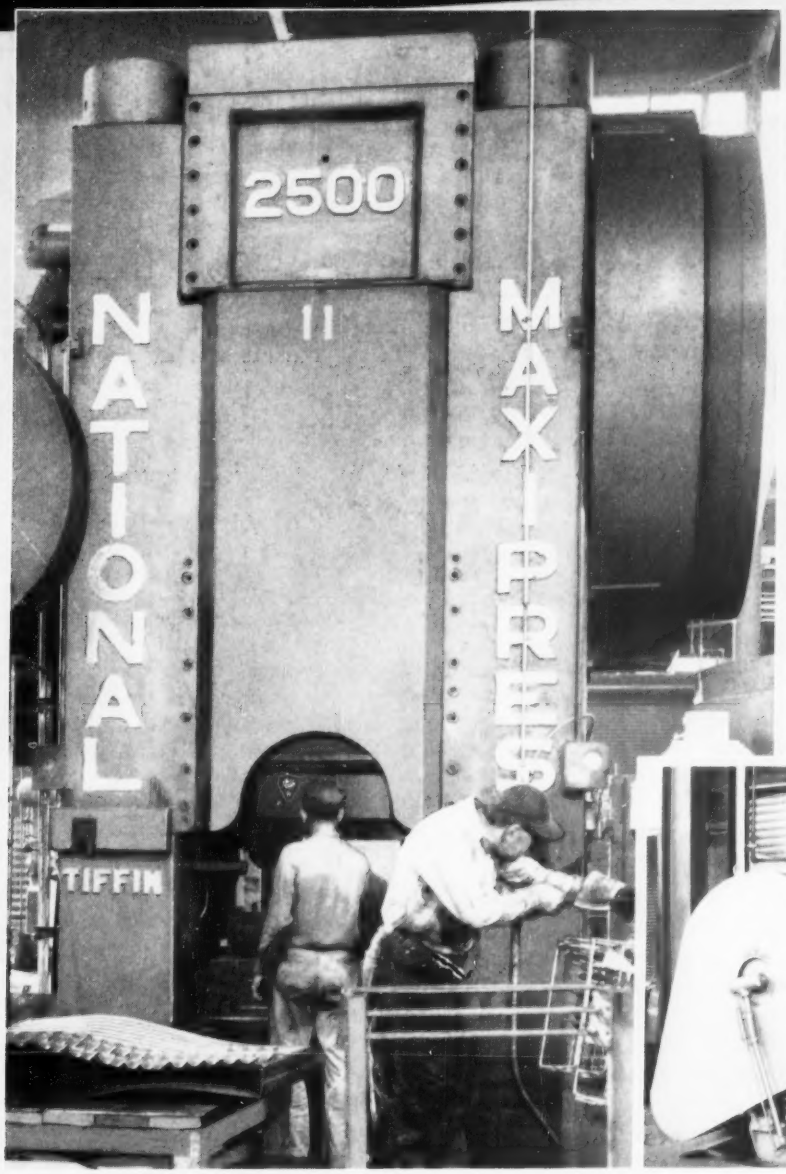
Hartford Detroit Chicago

# Relies Entirely on NATIONAL for Modern Precision Forgings!




*This 2500-ton Maxipres (one of 18) now in production in the modern forge shop of the Bingham-Herbrand Corp.*

*Six Reducerolls at Bingham-Herbrand quickly preform jet aircraft engine blade and bucket blanks for finish forging in Maxipresses.*

**NATIONAL**
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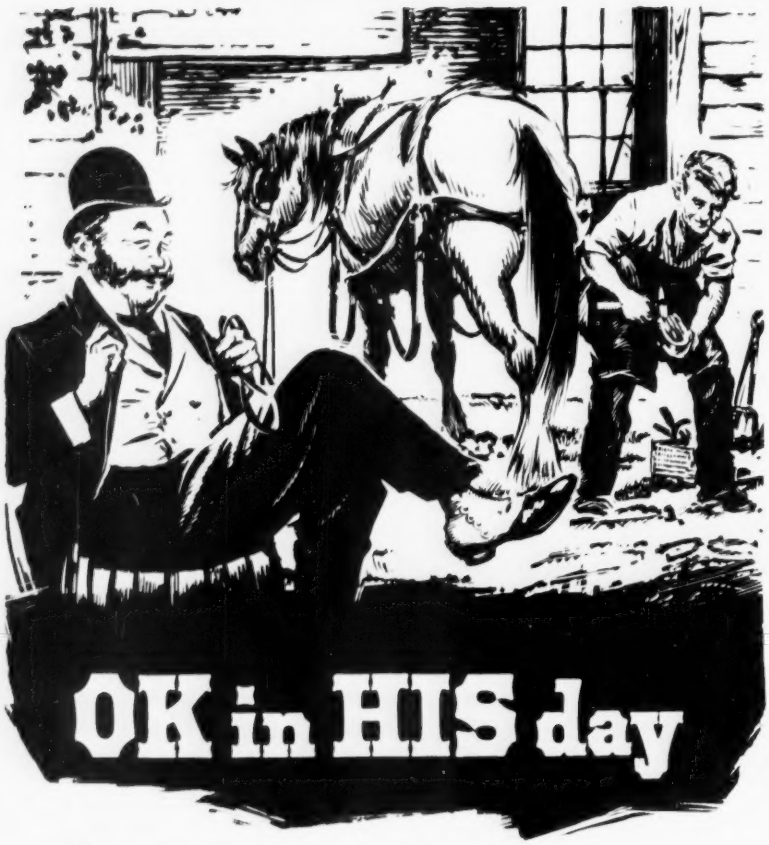


but . . .

TODAY'S PRODUCTION SCHEDULES *WON'T WAIT*

Back in the unhurried, uncomplicated days of the village blacksmith, forging jobs were delivered on a ". . . soon's I can get to it" basis . . . and that was good enough. But today's production schedules depend on the prompt availability and the dependability of every component.

Set up to produce and deliver forgings to tie in smoothly with your production schedules, Consolidated offers complete, modern facilities including a new die shop fully equipped with the latest die sinking machines. Here too is the experience and know-how it takes to supply forgings (in aluminum, titanium, alloy steel and many other metals) that meet today's exacting standards for strength, uniform high quality and economy.

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West Coast Representative:
A. C. Stearns Co., 3911 San Fernando Road, Glendale, Calif.

## Life for Steel Parts

PRODUCTIVE life of steel core rods has been increased as much as 12 to 27 times by having them flame-plated. Ford Motor Co.'s Plastic and Machining plant uses the process on core rod and sizing punch operations in the production of bearings, according to a report by Linde Air Products Co., New York.

In the first operation a core rod is used to form bearings from powdered metal. The productive life of this core rod was 15,000 parts. Flame-plating has increased the production of the same type steel rod to 100,000 parts. In the second operation a sizing punch is used to assure that inner and outer dimensions of the bearings meet specifications. In this work a single steel punch sized 10,000 bearings. Since it has been flame-plated production for one sizing punch has jumped to 270,000 units.

**Method** — Flame-plating is a method of applying tungsten carbide to metal parts. The deposit is made as a hard, wear-resistant coating that can be applied in thicknesses ranging from 0.002 inch to 0.010 inch. Low temperature deposition is a major advantage of this new process. The base metal does not exceed 400° F during coating. Result: No property change in base metal, little possibility of distortion.

## Design Handbook Revised

Third edition of a working handbook for engineers who are concerned with machine and structural design has been published. Called *Formulas for Stress and Strain*, by Raymond J. Roark, the book is also an auxiliary textbook for courses in stress analysis and elasticity.

It gives experimental data and revised empirical formulas, material on sheer lag, stress and deflection of circular arches, flat plates with large deflection, pressure vessels and shells, stress concentration, tables of coefficients for stress, deflection, and edge slope of flat plates. Book is published by McGraw-Hill Book Co. Inc., New York 36, contains 381 pages, and the price is $7.50.

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Microhoning is *the* industrial process which simultaneously gives you

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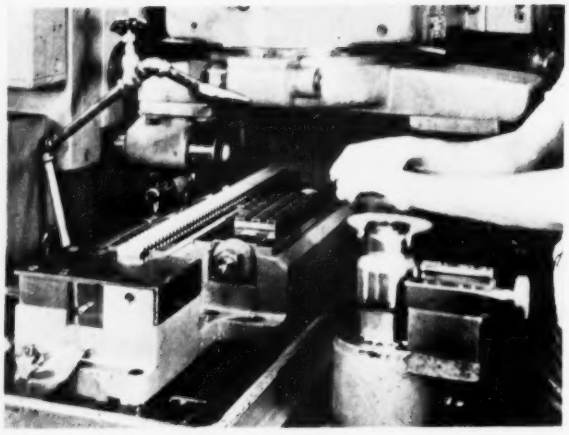
*Hydraulic controls • Diesel fuel injection equipment*

Work is in position in rack shaver. At left is master rack, longer than work rack at right. Offsetting master rack automatically results in work rack taking successive bites



Loading fixture used to align drive shaft and master gear is seen in right foreground. Pinion fits into a locating key; sleeve is lined up by pushing plunger into ground hole

# RACK SHAVER MEETS MACHINING DEADLINE

**Michigan Tool's setup had to square shaved portions of drive shaft teeth, and go full depth of teeth—in minimum time. A rack shaver with special tooling did the job**

PRODUCTION of a spline with alternating thick and thin steps on the longitudinal faces of teeth on the main drive shaft for a 6 x 6 truck led an automotive supplier to adopt a setup using a rack shaver with special tooling. Purpose of the thick and thin sections in the 17-tooth spline is to help the mating gears stay in mesh despite the angular thrust of a helical gear.

Two factors had to be considered in selecting the type of equipment that would be used to do the job. First, all shaved portions had to be squared off at the corners and go the full depth of the teeth. Second, time required to do the job had to be held to a minimum to keep costs in line.

**Winner on Both Counts** — On both counts the rack shaver, built by Michigan Tool Co., Detroit, provided the answer. It achieved the desired form completely and did the job in a two-minute machining cycle.

Shafts being shaved are SAE 8620 or 4620 steel. From 8 to 12 thousandths of stock is removed on a side. Involute spline teeth are hobbed with a relief at the root, so stock being removed in shaving can break free without danger of chips loading up at bottom of tooth, damaging blades.

To machine the involute spline on the main drive shaft, the shaft is assembled together with a master gear. Sleeve of the master gear slips over the threaded end of the main drive shaft. A nut placed over the threaded end holds the sleeve securely in place.

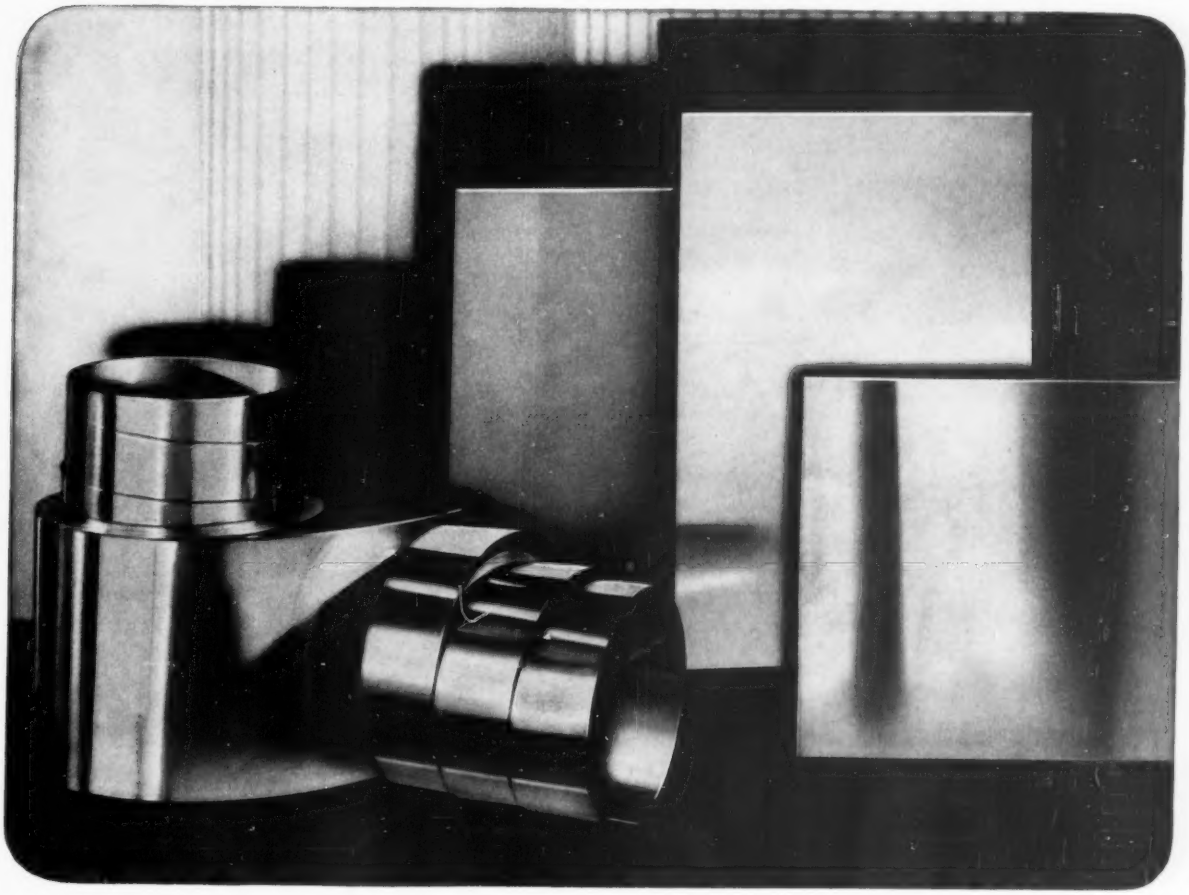
**Positions For Shaving**—Since relationship of master gear to spline being shaved is of considerable importance during the machining operation, a loading fixture shown in the right foreground of Fig. 3 is provided. The shaft and master gear assembly are placed into the loading fixture loosely assembled, and the teeth of the spline to be shaved fit into mating locating teeth in the fixture.

Control of amount of metal removed is automatic, being a function of the hydraulic circuit at the back of the machine. About 0.0015 to 0.002-inch of metal is removed in the first pass, about 0.0005-inch in the final pass.

Cutter production is 6000 pieces per grind, and the sharpening operation requires only removal of enough stock on the cutters to square up the tops. Blades are removed from the holder and sharpened on a standard surface grinder.

Sleeve (bottom) has master gear used in shaving pinion. Sleeve fits over drive shaft and is held in place by holding nut on threaded end of shaft

# Nickeloid Metals



LUSTROUS METALS, pre-plated with finishes of chrome, nickel, brass or copper.* *Modern* as tomorrow . . . *practical* as fifty-five years of metallurgical know-how can make them.

Nickeloid pre-plated metals open new fields of product design . . . add new functional beauty that makes your products stand out in the crowd of competition.

Here, too, is production economy . . . a shortcut manufacturing *method*. Pre-plated Nickeloid Metals require no costly, time-consuming cleaning, plating, polishing, painting or lacquering. They are ready for immediate assembly after they are stamped or formed. Nickeloid Metals are used for functional parts or as trim by hundreds of progressive manufacturers.

It will pay you to investigate Nickeloid Metals.

* Pre-plated to following base metals: steel, brass, copper, zinc or aluminum. Available in sheets or coils, and in interesting patterns and crimps.

**AMERICAN NICKELOID COMPANY**

ADMINISTRATIVE OFFICE: Peru 1, Illinois MILLS: Peru, Illinois and Walnutport, Pa.

# MODERN METALS

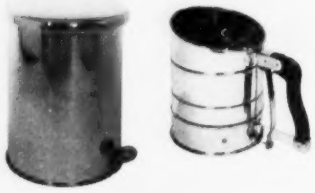
*for Modern Industry*

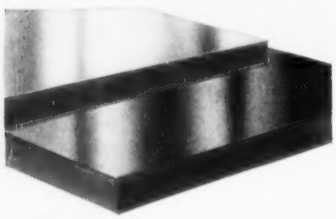
## EASILY WORKED

Stamp, blank, bend or draw . . . with good shop practice these versatile pre-plated metals can be fabricated just the same as unfinished metals. Supplied with Mar-Not to protect surface if desired. Can also be successfully welded, soldered, riveted, seamed.

## VERSATILE UTILITY

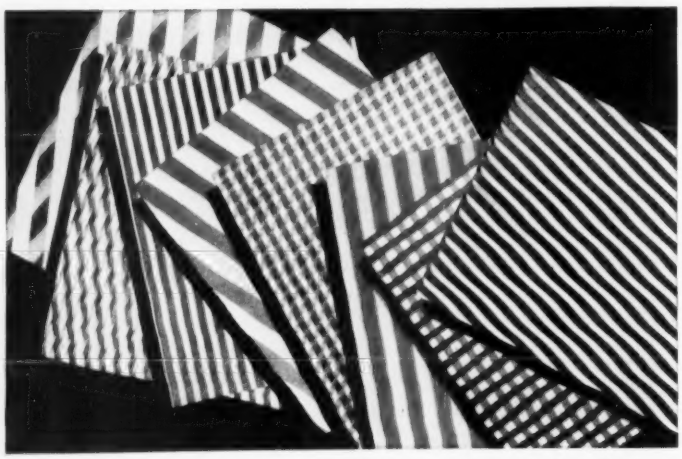
Nickeloid Metals are used extensively and profitably in these fields: electrical appliances, stoves and heaters, housewares, lighting fixtures, displays, stampings and many others. Ingenious designers are constantly opening up striking new uses for these metals.





## PROVEN DURABILITY

Hard-finished, durable Nickeloid Metals are easy to keep clean and lustrous. They resist rust, tarnish, abrasion, and corrosion. Electrolytically-deposited finish is guaranteed not to chip or peel. In ordinary use they will not blister or discolor. They are attractive, and stay looking that way longer.

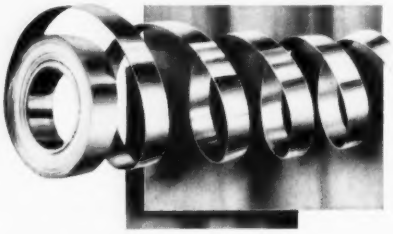


Beautiful crimps and stripes find many interesting and practical applications

*Sales offices in most principal cities*

## FUNCTIONAL BEAUTY

It's more than skin-deep . . . the beauty of Nickeloid Metals. Industrial designers find these lustrous metals ideal for functional as well as decorative parts of products. Progressive manufacturers know that Nickeloid Metals offer an economical way to meet the demand for modern product design. These gleaming metals add the eye appeal . . . the buy appeal that often spells the difference between inventory turn-over and hold-over on dealers' shelves and floors.



## PRACTICAL ECONOMY

Two production steps: fabricate and assemble . . . instead of five: fabricate, plate, polish, buff, assemble. Nickeloid Pre-Plated Metals are a durable finished raw material that provide the shortest distance between raw material and finished product . . . a longer margin between production cost and selling price. It's just good business to take advantage of such a sound production method. We can serve you promptly and well, and will be happy to work with you on your particular problem.

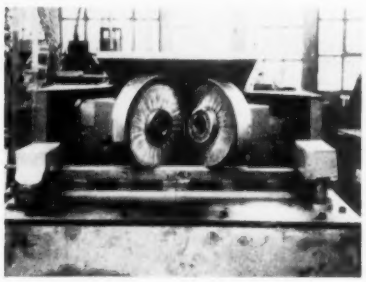
*Quality Metals Since 1898*

**AMERICAN NICKELOID COMPANY**

**PERU 1, ILLINOIS**

## Brushes Up Production

Deburring and blending of surface junctures and surface irregularities of gear racks has been put on the production line. The method has resulted in production increases of more than 500 per cent for American Type Founders Inc. It was designed and developed by them with the co-operation of Osborn Mfg. Co.



BRUSHES CONFORM TO CONTOUR
*. . . blend to form smooth juncture*

to deburr 17 foot gear racks. The method utilizes power brushes.

The setup provides a completely automatic gear driven sequence for deburring the gear racks at a speed of five fpm. When the entire rack has passed beneath the brushing area, a limit switch reverses both the direction of the feed and the rotational direction of the brushes finishing the two opposite sides of the gear teeth.

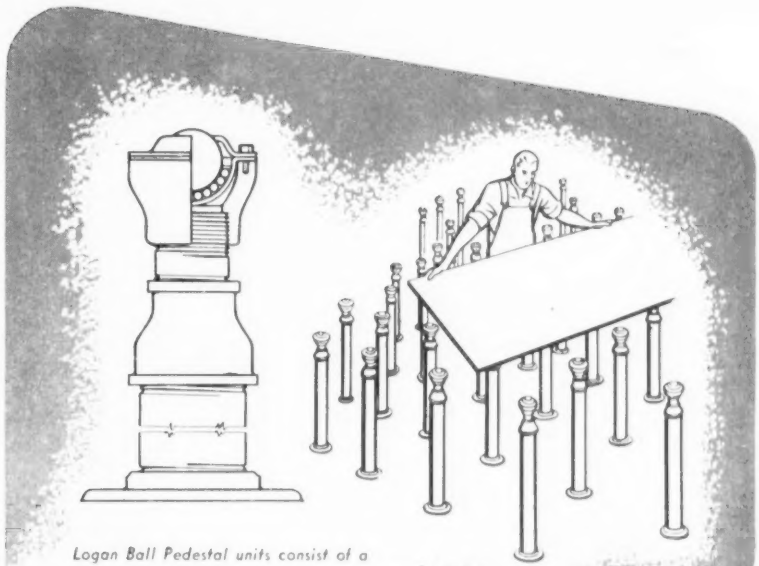
Special fiber-fill Fascut brushes manufactured by Osborn were specified. They rotate at 1750 rpm, permitting conformation to the irregular contours of the gear teeth.

## Plastic Conference

Manufacturers who use plastics in their products will explain how and why at the technical conference that will run concurrently with the 1954 National Plastics Exposition June 7 to 10 at Cleveland's Public Auditorium.

The exposition will be unique in that talks by the plastics industry's customers highlight the technical sessions, and speakers from diversified segments of the plastics industry itself will man one program.

The National plastics exposition is sponsored by the Society of the Plastics Industry Inc., New York.

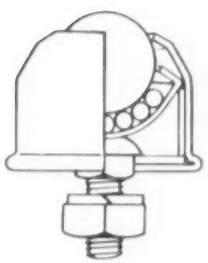



*Logan Ball Pedestal units consist of a large steel ball which rotates on a bed of smaller balls contained in a hardened steel cup with semi steel housing.*

**BALL PEDESTAL**

Logan Ball Pedestals are particularly adapted to handling sheets or plates around shears and punch presses or other machines. The ball units permit turning or moving the plates in any direction and the pedestal construction provides a means of conveying without blocking the working area.

Logan offers Ball Pedestal units in several sizes. Further information on request.

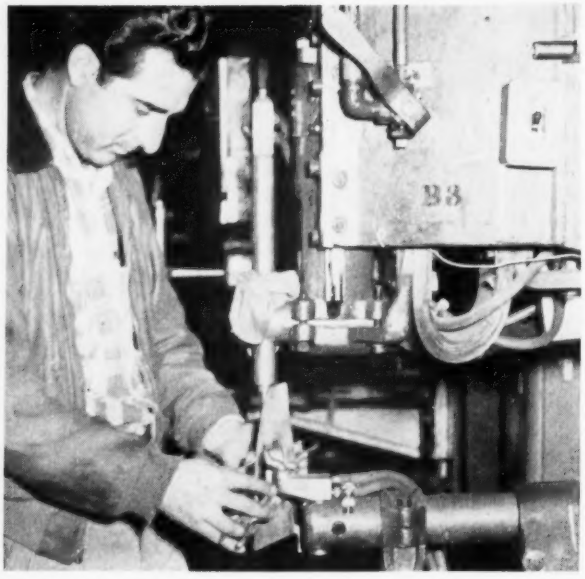


*Ball Transfer units also available for table mounting.*

**Logan Conveyors**

**LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.**

Titanium can be machined much the same as stainless steel, but it must be stress relieved after each operation



Convair resistance-welds titanium and titanium alloys with the same facilities used in joining ferrous parts

# Non-Heat Treatable Titanium GOES TO WORK

**Consolidated Vultee has a practical method for annealing the metal and its alloys after forming and machining. It's helped them build their new delta-winged fighters**

By THOMAS A. DICKINSON
Los Angeles

ONE of the first practical methods of processing non-heat treatable titanium and titanium alloys has been developed by Consolidated Vultee Aircraft Corp., San Diego, Calif.

Metals of the type in question are shown in an accompanying table. They are currently being produced as sheet, strip, plate, wire, bar and billet materials.

**Almost Misnomer**—These materials are said to be non-heat treatable because they cannot be tempered at elevated temperatures like steels. Actually, their processing involves a rather extensive use of heat. For example, in order to relieve stresses due to work hardening, Convair engineers have found it is necessary to:

(1) Heat the materials to 1075° ±25° F in a slightly oxidizing atmosphere for 15 minutes.

(2) Reduce the controller setting and stabilize the furnace temperature at 1000° F.

(3) Cool the materials in open air.

Where the materials have for some reason been heated to temperatures exceeding 1150° F, the above process is varied by initially heating the metals to 1300° F for 15 minutes—after which the furnace temperature is stabilized and the materials are air-cooled in the usual manner.

**Need Preheat**—Virtually all machining and forming operations, except for hot dimpling, necessitate the annealing of non-heat treatable titanium materials.

In addition, commercially-pure titanium materials are usually preheated to 550° ±50° F for at least 10 minutes prior to forming operations — during which forming tools, integrally heated to 550° ±50° F, are employed. Non-heat treatable titanium alloys can be formed in the same manner if they have been annealed; otherwise, tools and materials are preheated to 950° ±50° F in order to prevent cracking.

**Welding and Finishing** — Titanium and its alloys are now being resistance welded at Convair with the same machines and methods that are employed in work with ferrous alloys. They are not being

fusion welded to any great extent because of the danger of physical and metallurgical contamination, but have been satisfactorily processed in some circumstances with inert-arc and shielded or submerged-arc welding facilities.

Prior to finishing operations, the titanium components are cleaned with sand and vapor blasting facilities. Sand blasting normally involves the use of a light silica abrasive, and low pneumatic pressures are employed in work with parts thinner than 0.050-inch in order to prevent warpage.

Following a sand or vapor blasting operation, the parts are pickled in a 5 per cent hydrofluoric, 10 per cent nitric acid solution. Then each component is carefully inspected for flaws.

**Inspection**—Because titanium is non-magnetic, Convair now makes extensive use of penetrant inspection methods in non-destructively testing the subject materials. However, company engineers believe more accurate test results can be obtained in work with relatively thick or heavy titanium components by means of x-rays and ultrasonic inspection facilities.

Impression steel stamps are used by Convair inspection personnel in a conventional manner to mark those titanium components which are acceptable and suitable for finishing operations.

**Temperature Extremes** — For low-temperature applications, titanium parts are usually anodized in a chromic or sulphuric acid bath and then dyed or organically finished—much the same as aluminum is processed. If the parts must

**NON-HEAT TREATABLE TYPES OF TITANIUM AND TITANIUM ALLOYS**

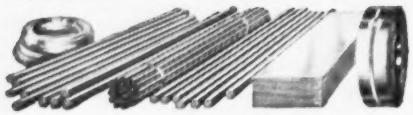
| Type | Designation | Composition % Al | Composition % Mn | Yield Str., 0.2% Offset, P.S.I. | Tensile Strength, P.S.I. | Rockwell C Hardness |
|---|---|---|---|---|---|---|
| Pure | Rem-Cru RC-70* | | | 70,000 | 80,000 | 20 |
| Pure | Republic RS-70* | | | 70,000 | 80,000 | 20 |
| Alloy | Rem-Cru RC-130A* | | 8 | 110,000 | 120,000 | 30 |
| Alloy | Republic RS-120* | | 7 | 120,000 | 130,000 | 31 |
| Alloy | Rem-Cru RC-130B** | 4 | 4 | 130,000 | 140,000 | 33 |

*Sheet Stock **Forgings and Bar Stock

For low-temperature applications, titanium can be anodized and spray finished like most aluminum alloys

Corrosion-resistant titanium parts have contributed much to the success of Convair's Sea Dart supersonic fighter

(Advertisement)

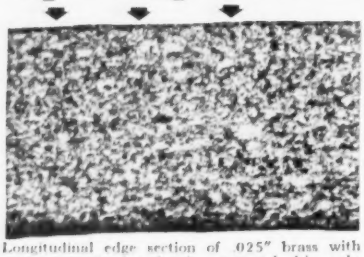


BRIDGEPORT BRASS COMPANY

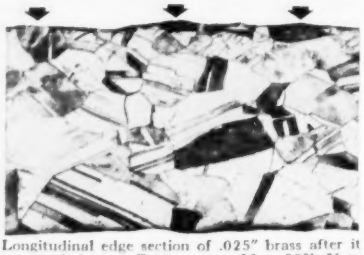
# COPPER ALLOY BULLETIN

Bridgeport BRASS CO. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

## Reducing Polishing Costs By Using Ultra Fine Grain Structure



Longitudinal edge section of .025" brass with .010 mm grain size after it was stretched in making an Erickson cup. Mag. 75X. Note smooth surface on top edge (surface of metal)—see arrows.



Longitudinal edge section of .025" brass after it was made into an Erickson cup. Mag. 75X. Note bumpy condition on top edge (surface of metal)—see arrows.

In recent years the trend has been toward lighter gauges of brass and copper strip for fabrication purposes in order to keep metal costs to a minimum and still retain the intrinsic advantages of copper-base alloys.

Metal with thinner gauges and smaller cross-sectional areas possesses a lower breaking strength and less ability to withstand stretching. However, these disadvantages are being offset in part, at least, by applying special metallurgical know-how during processing of thin gauge metals.

### Effect of Grain Size

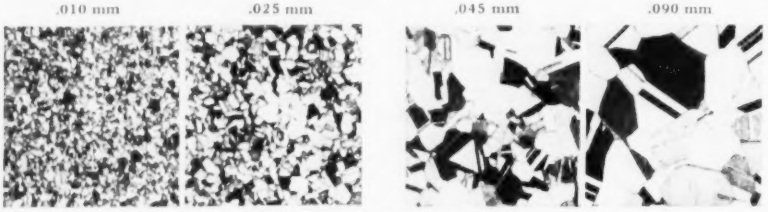
It has long been known that grain size affects such physical properties as tensile strength, per cent elongation, Rockwell hardness and ductility. The smaller the grain size, the higher the tensile strength and the greater the hardness. For example, annealed 70-30 Brass with a grain size .045 mm averages about 48,000 pounds per square inch in tensile strength as compared with about 58,000 pounds per square inch for brass with a grain size of .010 mm.

For many years we have been supplying annealed brass on thin gauges with a grain size as fine as .010 mm. Today a grain size as low as .005 mm is applied for some applications. Microstructures of such fine grain sizes are designated as Ultra Fine Grain.

Ultra Fine Grain brass approaches normal brass, quarter hard temper, (reduced 1 number B&S) in tensile strength, Rockwell hardness, stiffness and springiness. However, its ductility is somewhat higher than quarter hard temper. It is suitable for shallow drawing, forming and stamping.

### Roughness from Stretching Explained

When metal is stretched beyond its yield point, movement takes place both at the slip planes in the crystals as well as along the crystal boundaries. Illustrated are samples of brass which were annealed with .010 mm and .080 mm grain sizes, then made into Erickson cups. Micrographs of the longitudinal edge sections of these samples clearly show that the high points in coarse grain metal are considerably higher than those in fine grain metal. Obviously, it takes more polishing effort to cut down the higher points of coarse grain metal than it does of fine grain metal.




Etch $NH_4OH + H_2O_2$ Mag. 75X

### Ultra Fine Grain Reduces Polishing

Ultra Fine Grain brass is generally satisfactory for items made by forming and stamping. Forming is an operation which changes a blank to a cup such as a lamp base or clock case without materially changing the thickness of the metal or appreciably stretching it on the bottom or side walls. The fine grain structure gives the metal adequate strength to withstand the forming operation without breaking. Any stretching which develops does not result in the formation of a rough surface. Consequently, a minimum of polishing is required to bring up a high lustre.

Stampings such as escutcheons and fishing lures, which carry designs either raised or sunk into the metal, can also advantageously be made from Ultra Fine Grain brass. Here both sharp impressions and a smooth surface for economical polishing are attained.

Ultra Fine Grain brass is excellent for frames for fireplace screens where the metal is bent 90°. Smooth corners and satisfactory stiffness result. Economies in finishing, yet highest quality are attained.

Fine grain brasses cannot be used indiscriminately because they are apt to be stiff and springy. However, metal fabricators may be able to design parts around their capabilities and economies although special tooling may be required.

Among the many applications for Ultra Fine Grain metal are ornamental jewelry, pocketbook frames, vanities, lipstick containers, lamp bases, escutcheons, flanges, building hardware, fireplace screen frames, gift items, fishing lures, clock cases, metal boxes, lamps, lighting fixtures and many other similar applications.

### Investigate Before Ordering

When considering Ultra Fine Grain for a new application, using simple or moderate forming operations, full information should be furnished to the mill to make sure that such material will withstand the necessary mechanical operations. Contact our nearest Sales Office if you are interested in obtaining greater economies in your finishing operations through using brass or copper designed for your specific needs. (1493)

## CAUSES OF CORROSION

*This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.*

### COPPER AND COPPER ALLOYS vs. SODIUM CHLORIDE SOLUTIONS (Cont.)

#### Effect of Concentration of Sodium Chloride vs. Potential of Copper

Sometimes variations in sodium chloride concentration can lead to localized corrosion of copper and copper alloys. This was demonstrated by Evans, who studied the cell: Cu/ Concentrated NaCl/ Dilute NaCl/ Cu, as illustrated in the diagram below. "The copper in the concentrated salt solution is the anode, doubtless passing into the solution as complexions, which will be more stable in concentrated than in dilute chloride solution."(1)

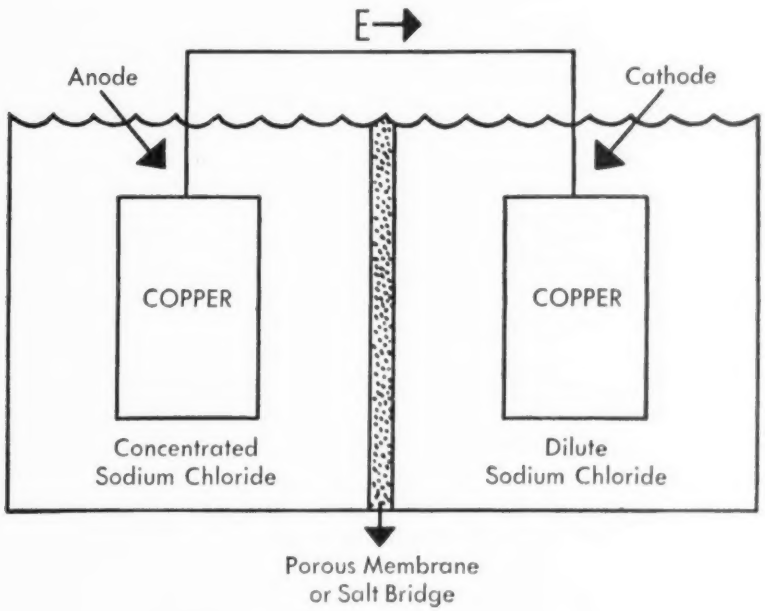
It should be noted that the table of "Potentials of Copper versus Sodium Chloride Concentration" shows that the potentials increase with increasing sodium chloride concentrations.

This table shows clearly that a potential difference of 0.1—0.2 volt or more can be set up between copper surfaces immersed in dilute and more concentrated sodium chloride solution. In practice, the formation of sodium chloride concentration cells is avoided by proper mixing of solutions and care in design to eliminate crevices, stagnant areas, etc.

Concentrations of Sodium Chloride vs. Potential of Copper at 18°C(2)

| Concentration of Sodium Chloride | Potential in Volts Saturated Calomel Scale |
|---|---|
| 5.0 N | —0.340 |
| 4.0 N | —0.331 |
| 3.0 N | —0.296 |
| 2.0 N | —0.270 |
| 1.0 N | —0.242 |
| 0.10 N | —0.168 |
| 0.01 N | —0.121 |

*(1)U. R. Evans, Metallic Corrosion, Passivity and Protection, p. 256 (1937)*
*(2)Schmid & Winklemann, Helv. Chim. Acta 13, 304 (1930)*




## NEW DEVELOPMENTS

*This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.*

**Pneumatic Impact Press** delivers 30 to 30,000-lb. impact at speeds to 10,000 cycles per hour, according to the manufacturer, and is useful on wide range of impact operations, either one-shot or progressive, such as impression marking, stamping, staking, swaging, upsetting or riveting. By adding time-dwell valve, maker claims, press can be used for squeezing and heat branding. **No. 1377**

**Self-Locking Chuck** permits hand application of cutter for self-tightening action as soon as machine spindle brings cutter into action, maker reports. Tightening action of cutter causes a drift to lock. It is loosened by turning a key against spring action, releasing drift. Cutter then removed by hand. **No. 1378**

**Hydraulic Stock Feed** attachment for screw machines will speed stock handling yet will not mar or scratch ground and polished stock, it is stated. It is available for 00, 0 and 2 B & S machines and feeds stock from 1/16 to 1-1/8-in. diameter. It is adjustable to feed up to 5 in. per stroke, has light that flashes on when end of bar approaches, and contains own hydraulic system and pump. Installation is simple, maker adds. **No. 1379**

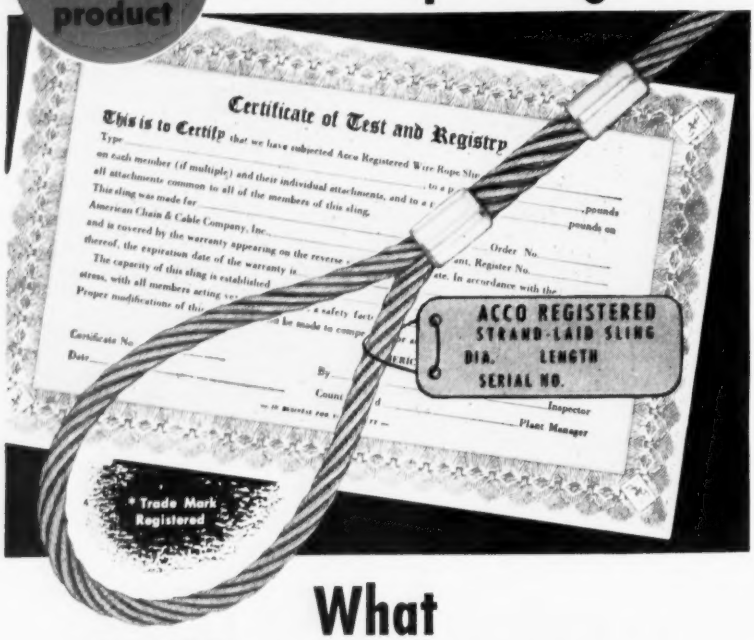
**Dial Micrometer** for laboratory or production work has 6-in. dial measuring to 0.5 in. in increments of 0.001 in., manufacturer asserts. Screw-type zero adjustment is provided. It is claimed unit is designed for laboratory requirements yet is sturdy enough for production use. **No. 1380**

**Wet-Blasting Machine** is designed for bulk, high-rate finishing, cleaning or deburring of small parts such as screw machine products, stampings, small castings and extrusions, and precision machined components, maker claims. Barrel is variable speed, 0 to 78 rpm; blast gun is stationary but adjustable, armports and knee-actuated triggers allow easy manual operation. **No. 1381**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
*Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal*
*Warehouse Service with Slitting Facilities in Principal Cities* (Advertisement)

an ACCO product

# ACCO Registered* Wire Rope Slings




## What ACCO Registered Means

• Primarily it means greater safety for your men and machines when loads are carried in the air in your shop. It means insurance against dropping a load which could tie up production.

But that's only part of the story. The name ACCO *Registered* on the slings you use means greater efficiency because of better design of endings and attachments. It means lower overall sling costs because every part of every ACCO *Registered* Wire Rope Sling has the same strength as the catalog breaking strength of the rope itself. ACCO even magnafluxes each hook to make doubly sure it will serve you well.

And it means that the sling has been proof-tested at the factory to twice its rated capacity. You can be sure that every ACCO *Registered* Wire Rope Sling is the safest, strongest and lowest cost lifting tool you have ever used.

Best of all, you can get them when you need them from a nearby stock. Contact your ACCO *Registered* distributor today for full information and prices. Or, write our Wilkes-Barre, Pa., office.

1 The best material
2 Unit safety factor (on bodies, rings, links, safety shackles, hooks)
3 Proof test of complete sling to twice rated capacity
4 Actual field service test of each model
5 Metal identification tag on each sling
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ACCO
TRADE MARK

Wire Rope Sling Department
AMERICAN CHAIN & CABLE

Wilkes Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn. • In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

plus Links Shackles Hooks


**TITANIUM . . .**

withstand temperatures exceeding 800° F, the use of a heat-resistant ceramic coating is usually specified in order to prevent oxidation.

**Why It's Used**—Despite their relatively high cost as raw and fabricated materials, titanium and titanium alloys are now being extensively employed by Convair in the manufacture of new supersonic delta-wing fighters for the U. S. Air Force and Navy because:

(a) They weigh only slightly more than the superaluminum alloys, yet have mechanical strength comparable to that of the supersteel alloys.

(b) They are highly resistant to corrosive media such as salt water, which causes steel and aluminum parts to deteriorate rapidly.

(c) They have excellent mechanical strength at moderately-elevated temperatures and even at high temperatures (1000° F or more, if they are adequately protected against oxidation) because of titanium's unusually high melting point (3140° F).

## Summer Session on X-Ray

Metallurgical applications of x-ray diffraction will be the subject of a two week special summer program from August 2 through August 13 during the 1954 summer session at Massachusetts Institute of Technology.

The program is planned to include lectures in the mornings and laboratory demonstrations and discussions in the afternoons. Topics to be considered include: Emission and absorption of x-rays; the diffraction process; interpretation of powder diffraction patterns; precise lattice constant determination.

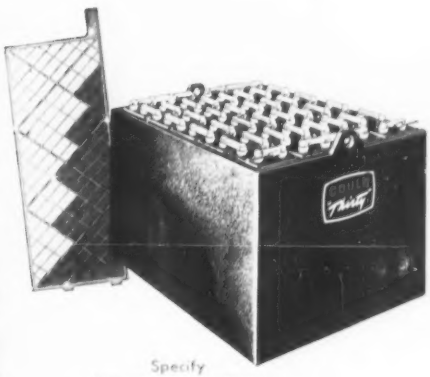
It is explained that the program is not envisioned as a research conference. The lectures will be directed toward metallurgists who have not had advanced work or who may have been out of school for several years. Elementary knowledge of the nature of x-rays and metals structure is required.

Further information and application blanks may be had by writing to the Summer Session Office, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

## Plenty of Reserve Strength

# THANKS TO BATTERY POWER!

There's nothing like battery power for rough, tough industrial truck service. Only battery power gives you the extra reserve to meet the stringent demands for higher lifts, faster maneuvering and continuous all-day operation. And the Gould "Thirty" with new Diamond "Z" Grids has the unique features of design that give you extra battery performance and longer battery life . . . make your trucks work harder and longer.



Specify
THE GOULD "THIRTY"
with New Diamond "Z" Grids—
America's Finest
Industrial Truck Battery

# GOULD *INDUSTRIAL BATTERIES*

**GOULD-NATIONAL BATTERIES, INC.,** TRENTON 7, N. J.

*Always Use Gould-National Automobile and Truck Batteries*

©1954 Gould-National Batteries, Inc.

## Carbides Solve Problems

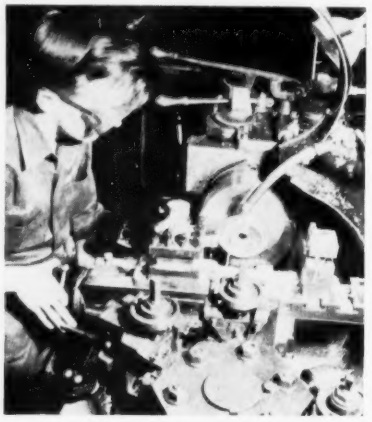
HAVING to discard steel cutting tools at the rate of more than one tool per acceptable part was a problem facing Master Machinery Builders. It got to be an expensive proposition. A second problem facing them was that of producing fine finishes on a highly abrasive aluminum-bronze die casting. The big question was how to produce this complex part for the control assembly of a medium tank without ruining tools to the point of no return. Parts are finished within 30 micro-inches.

Here's how both problems were licked. They employed cemented carbides.

With carbides, tool life jumped 2400 times. Over 200 parts were produced per tool grind. To date, nearly 3000 parts have been completed without a single reject.

The cemented carbide involved is Carboloy grade 78B, brazed to standard tools made by Carboloy Department of General Electric. Complete machining of a single part on this particular job required about 7 hours. The work is done on a Warner & Swasey No. 3 turret lathe and involves the use of special jigs and fixtures to handle a sequence of 40 operations such as turning, facing, boring, chamfering and reaming.

Eight of these operations are performed with a standard Carboloy single-point tool. The first operation, for example, is an outside diameter turning job involving a single-point tool. This is followed up with boring and reaming requiring the use of a special jig. The turning operation, incidentally, is run at 560 sfm as are the subsequent facing operations, a couple of which involve two tools facing both sides of the work simultaneously.



FINISHING ALUMINUM-BRONZE
*. . . 200 parts per tool grind*

In the entire operation Master Machinery makes use of two jigs and new turret mounts after the initial 14 operations. The use of jigs enables the company to combine as many as three operations on one machine.

## Heating Furnace Data

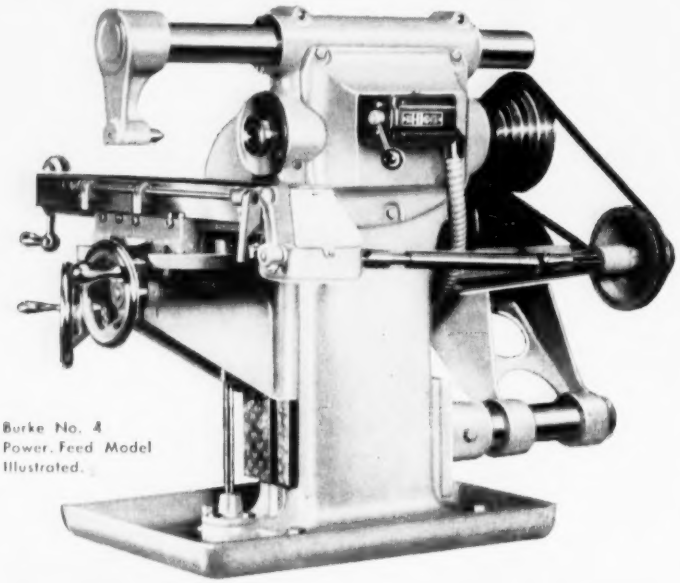
A booklet called Instrumentation and Control of Mill Furnaces covers measurements and controls for operation of mill furnaces, instrumentation systems for soaking pits and reheating furnaces, experiences and achievements in use of automatic control, installation and maintenance of instruments.

It contains 36 pages and is published by British Iron and Steel Research Association, 11 Park Lane, London W1.


# IT'S AMAZING

### what these little rascals can do!

That's why Burke Bench Millers are a big favorite in thousands of tool, school, development, repair and mass production shops.



Burke No. 4 Power Feed Model Illustrated.

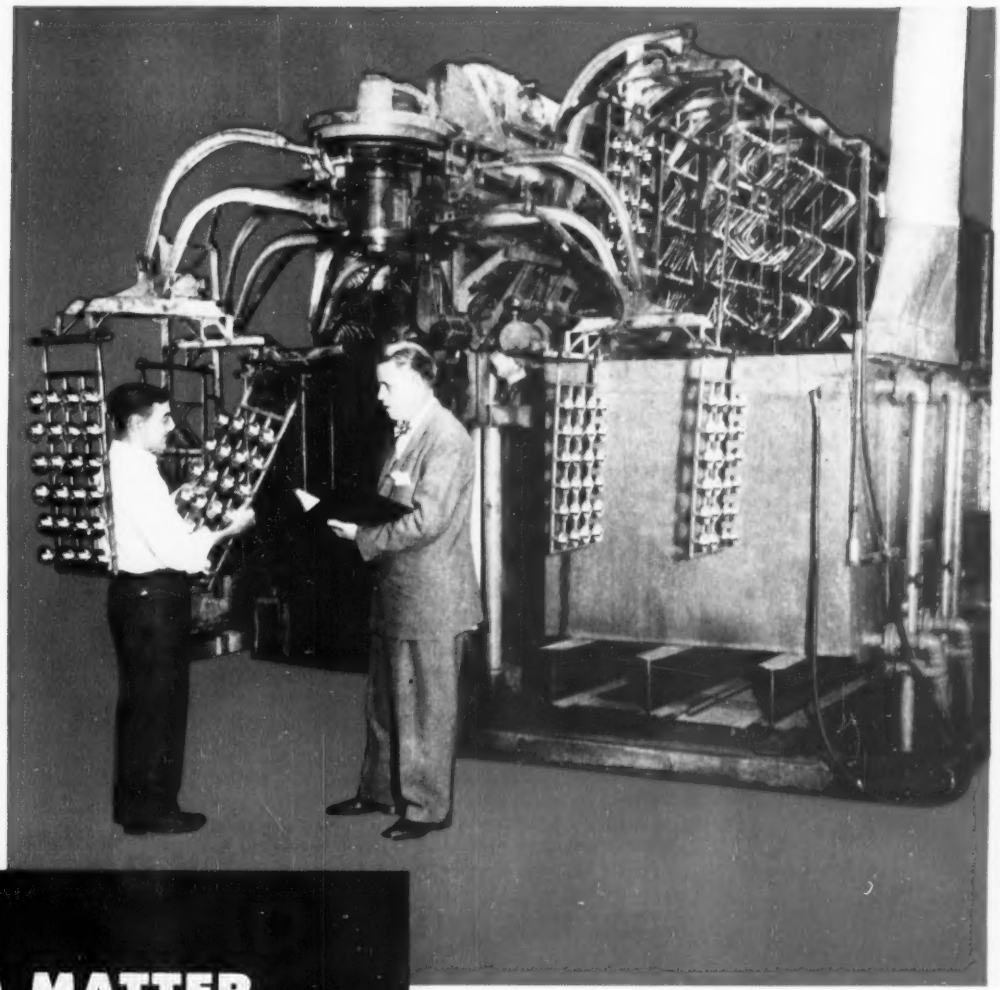
# BURKE Bench Millers

— are so rugged, accurate and versatile they can practically reproduce themselves!

*Send for complete data on models, specifications and full line of attachments.*

THE U. S. BURKE MACHINE TOOL DIV.

Brotherton Road 14, Cincinnati 27, Ohio



*Stevens Model "A" Automatic Plating Machine*

# "NO MATTER WHAT THE JOB . . . STEVENS does it— and does it *better!*"

That's the report of the New England Plating Co., Worcester, Massachusetts. At present, New England Plating has 2 Stevens machines in operation. With this equipment, they do nickel plating and dichromating automatically—quickly—economically!

These Stevens Automatic Plating machines have launched the New England Plating Company on an entirely new phase of the company's history. They are contemplating the installation of still a third Frederic B. Stevens machine in the near future.

Let us help you with your plating problems. Call a Stevens technical representative – there's one in principal cities – or write direct. FREDERIC B. STEVENS, INC., DETROIT 16, MICH.

FREDERIC B.
STEVENS
INCORPORATED
EVERYTHING FOR METAL FINISHING
DETROIT 16, MICHIGAN

*BRANCHES:* BUFFALO • CLEVELAND • INDIANAPOLIS • NEW HAVEN • DAYTON
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THE INDUSTRIES' Best KNOWN TRADEMARK!

## MACDERMID BRIGHT COPPER PLATING PROCESS

Lower your cost and improve your finish by installing the MacDermid Cyanide Bright Copper Plating Process . . . *go directly from the copper bath through subsequent nickel and chrome plating solutions with no intermediate buffing operations.*

Improve your corrosion resistance by adding Metex Copper Brightener to your present copper solution . . . *the extremely fine grained copper deposit will add beauty and extra corrosion resistance to your product.*

## FOR HEAT TREAT STOP-OFF

Rocheltex Liquid Addition Agent *will increase your speed of plating by as much as 20%* when added to your present cyanide copper bath.

The fine grained semi-lustrous copper deposit eliminates *rejects* due to hard spots *while it cuts your plating costs* through the reduction of chemicals required to maintain the copper solution.

The addition of Rocheltex also *reduces stream pollution* because it *eliminates the need of periodically dumping the copper cyanide solution.*

Write today for free data sheets on the above compounds and the name of the MacDermid Incorporated Chemical Engineer in your territory.

*Write For Free Data Sheets*

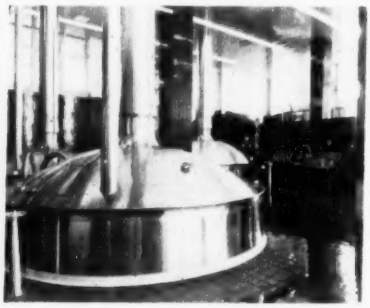
MAC DERMID
★ *Incorporated* ★
WATERBURY 20, CONNECTICUT

Manufacturing Facilities also at
MICHIGAN • OHIO • ILLINOIS • CALIFORNIA


## Stainless for Brew

THE FABRICATION and installation of the first all-stainless-steel-equipped brewhall was completed by Nooter Corp., St. Louis. The equipment has been installed in the $20 million Anheuser-Busch brewery in the San Fernando Valley, Los Angeles.

The equipment is practically quake-proof in deference to the area. It is highly polished by a special polishing tool which finishes an entire tank in a continuing stroke without stopping. The three tanks are suspended at the waist from the floor beams of the plant itself. The remaining tanks



BREWING EQUIPMENT
*. . . 75 tons of stainless*

are on steel legs, sunk deep into beams in the floor. The concrete beams then absorb much of the lateral strain, cushioning the effect of a shock wave. Cleaning and maintenance is also more economical without the complicated framing of the support structure.

In all, the job required more than 75 tons of stainless steel and was shipped in twelve carloads from Nooter's plant to the brewery site for erection.

## Temperature Facts Published

Temperature Measurement in Engineering by H. Dean Baker, Ph.D., E. A. Ryder, M. E., and N. H. Baker, M.A., is the first of two volumes discussing temperature in terms of engineering measurement. Presented here are facts needed to design, construct, and operate an effective temperature measurement installation. You are shown how to apply these facts.

It is published by John Wiley & Sons Inc., New York 16, is 179 pages long and costs $3.75.

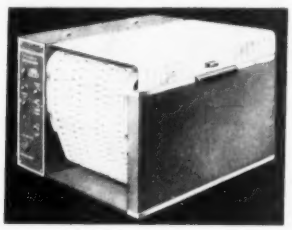
# NEW PRODUCTS and equipment

**Reply card on page 159 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue**

## Oscillogram Developer

*. . . is semi-portable*

An oscillogram developer capable of developing and drying photosensitive paper at speeds up to 12 fpm has been developed by G.E.'s Meter and Instrument Department.



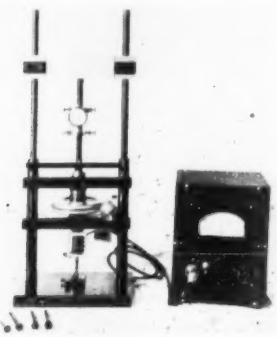
It consists of four open tanks, surface drying unit, motor controls and paper guides. The tanks stand in a water jacket electrically heated and thermostatically controlled to 100° F. General Electric Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

## Portable Comparator

*. . . weighs 44 pounds*

For calibrating extensometers, compressometers, dial gages and similar instruments, Baldwin-Lima-Hamilton offers a new extensometer comparator.



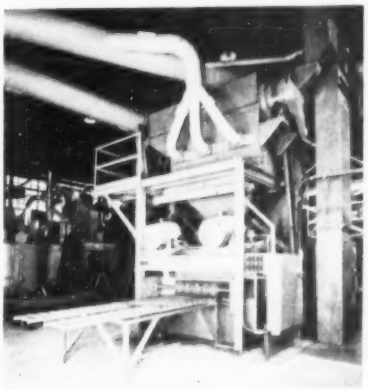
Some of the features included are: Small size and portability; the elimination of mechanical linkages as a source of error accomplished by the use of a Microformer (miniature variable transformer) and null balance indicator; gage lengths up to 10 inches and ranges up to 0.250 inch. Over-all dimensions of the comparator are 25 x 10 x 7 inches. Both comparator and null-balance indicator are furnished with wooden carrying cases. Gage blocks can be supplied. Baldwin-Lima-Hamilton Corp.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

## Sheet Blast Machine

*. . . for better bonding*

Steel sheet and plate up to 54 inches in width can be cleaned at a production rate of 20 to 80 lineal fpm with the ES-503 Rotoblast machine.



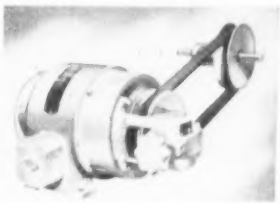
The machine is capable of cleaning in excess of 200 square feet of surface per minute. It is equipped with two Rotoblast wheels which throw 160,000 pounds of abrasive per hour. It has been designed to take the steel sheet or plate into the blast chamber automatically, blast its surface, and remove all abrasive from the sheet before it is discharged from the machine. The abrasive cleaning operation is accomplished by means of a blow-off fan which deposits the abrasive in a spiral conveyor. Over-all dimensions of the machine are approximately 22 feet high, 18 feet wide and 15 feet long. Pangborn Corp.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

## Special Motor Adapter

*. . . end bell for direct mounting*

A motor design featuring a special adapter end bell for direct mounting of Reeves Flexi-Speed Drives eliminates the need for a separate foot-mounted index support and permits the mounting of both the motor and drive as a single, compact unit.



The adapter can be used whenever there is a need to vary a machine's running speed to suit a specific work load. Easier layout and mounting, and space saving are additional features. Reuland Electric Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

## Throatless Shear

*. . . operates on air pressure*

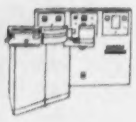
A pneumatically operated high production throatless shear which operates on shop air pressure (60-100 psi), recently introduced by Beverly Shear, makes any cut, straight, curved or irregular, and

# You Get Speed *and* Accuracy With ARL Production Control Quantometers

**If you maintain quality control of materials by chemical analysis,**

## Here Are Facts That Will Amaze You!

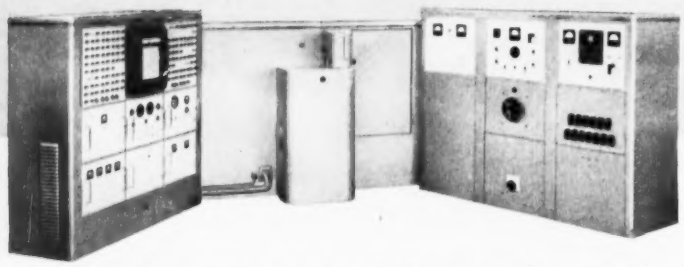
**A Chemist** averages 26 element determinations per day.



**Spectrographic** equipment raises his capacity to 150 element determinations per day.

**ARL Production Control Quantometers*** allow him to average 600 determinations per day . . . 23 times his output by chemical means.

**This money-saving speed is important to you, but even more important— Is the Accuracy of the PCQ!**



The PCQ offers accuracy equivalent to that obtained by routine chemical analysis.

Other advantages of the PCQ are: simplicity of operation to reduce human error to a minimum; analysis of 35 elements of your choice—up to 20 simultaneously; automatic inked record in duplicate of the concentration of elements present in alloys and inorganic compounds, in less than two minutes.

Mail the coupon today. An ARL field engineer will be glad to show you how to profitably apply the PCQ to your control problem.

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Gentlemen: Please send me complete information on the ARL Production Control Quantometer.

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Address _____

City _____ State _____


## NEW PRODUCTS and equipment

has a capacity of 3/16 inch in mild steel and 10 gage in stainless.

A double acting trunnion mounted cylinder has its piston rod directly connected to the upper blade actuation arm for straight line power strokes and greatest operating efficiency. Power stroke and

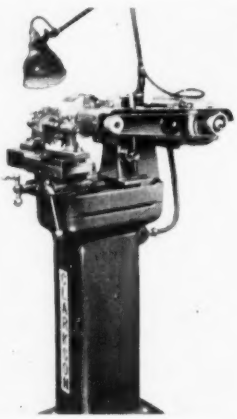
power return are controlled by a solenoid operated 4-way valve. The air cylinder has solid steel heads, caps and mountings and meets J.I.C. pneumatic standards. High chrome blades have correct rake to give clean, burr-free cutting. Blades are adjustable for wear and are quickly interchangeable. Beverly Shear Mfg. Co.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

### Cutter Grinder

*. . . with adjustable lamp*

Simplicity and ease of operation are two features of Clarkson's newest cutter grinder. Cutters can be



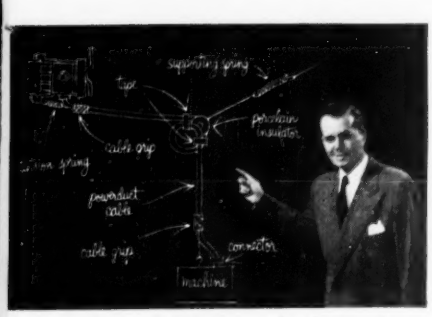
set and completely sharpened in 15 to 25 minutes, according to type.

Powered by a ½-hp motor, the grinder is always operated from

**FLEXIBLE BUSDROP CABLE**

**POWERDUCT** eliminates expensive rewiring when equipment must be moved.

# This cable makes machinery mobile




**PLUG IN POWERDUCT** at busduct and machine. See how spring keeps cable taut. There is no costly rigid conduit to rip out.

You may not be utilizing the full flexibility of your busduct system . . . if you aren't matching it with equally flexible, UL-approved ANACONDA Powerduct Cable.

This busdrop cable permits you to quickly relocate machinery. There is none of the expense and bother of ripping out permanent or semi-permanent wiring.

Powerduct is the only nonmetallic-armored busdrop cable approved by Underwriters' Laboratories, Inc. for busway branches under section 3646, 1951 National Electric Code. Always ask for it at your regular supplier. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* A-3113

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**TODAY'S HEADQUARTERS FOR INDUSTRIAL WIRING**

*Building wire and cable • power and busdrop cables • control and communication wire and cable • distribution cables • magnet wire • wire and cable accessories*

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# 52100

## STEEL TUBING and BARS

**TUBES** Warehouse and mill shipment with more than 200 seamless tube sizes to choose from .950" O. D. to 8.750" O.D.

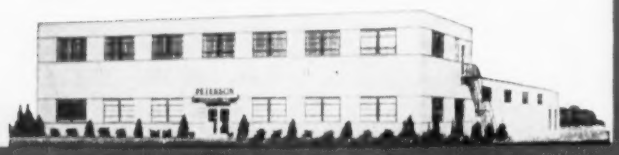
**BARS** In sizes from .171" round to 8.750" round. Warehouse and mill shipment.

**WIRE** Mill shipment of hot rolled or cold drawn ball, roller and needle wire.

**FORGINGS** Quick shipment of all analyses.

*Write for the latest stock list*

Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. S.



**PETERSON STEELS, INC.**

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois


## NEW PRODUCTS and equipment

the front, placing the work in easy view of the operator. Equipment can be supplied to permit all straight and Morse taper shank cutters to be sharpened, and all size side and face cutters up to 6-inch diameter with 1-inch diameter and 1¼-inch diameter holes. Clarkson Inc.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

### Stainless Tubing

*. . . is corrosion resistant*

A high strength, thin wall stainless steel tubing has been developed by Flexonics for industrial uses where corrosion resistance, light weight and special shapes or bends may be required.

Both standard and high strength stainless steel straight wall tubing are available. The latter gains

greater yield and tensile strength for the same wall thickness through a work-hardening process. This also makes tubing more crush-resistant, due to higher temper of the metal. Substantial weight and material savings are effected by the high strength over the standard. Flexonics Corp.

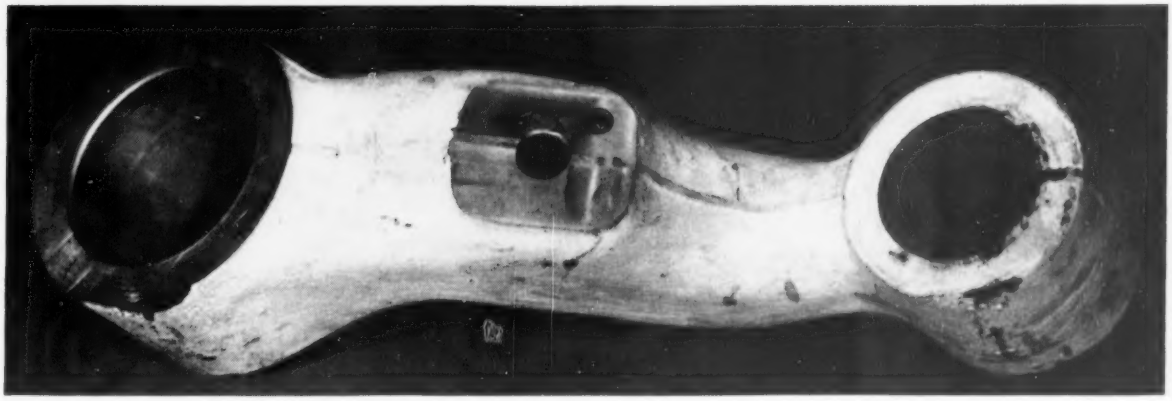
FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

### Spray System

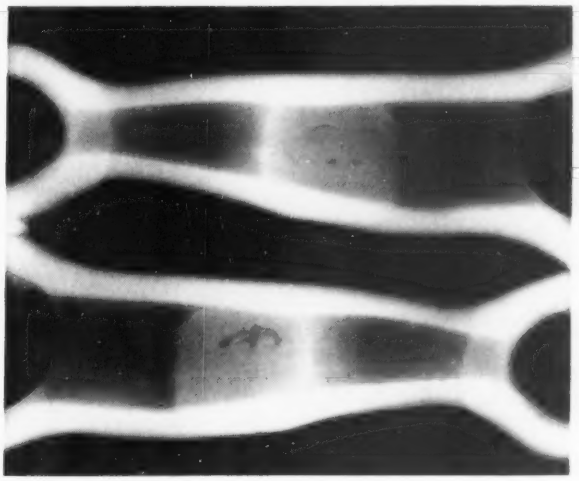
*. . . for efficient application*

The Spray-Lube system is designed to permit more efficient utilization of cutting oils and drawing compounds, thereby making it possible to increase cutting feeds and speeds and at the same time prolong tool life.

Among the advantages claimed are: The spray can be applied to the work area from any required direction and to as many points as necessary to cover the critical areas of contact between the cutting tools and work piece; the oil spray more



## Ankle Bone for tons of tank—



# RADIOGRAPHY proves it sound

**It's the support** for the track wheel of a tank—a tough job if there ever was one. Failure would mean complete disablement.

With soundness so vital, every casting was radiographed. It's the one way to prove that no hidden flaw exists without destroying the part.

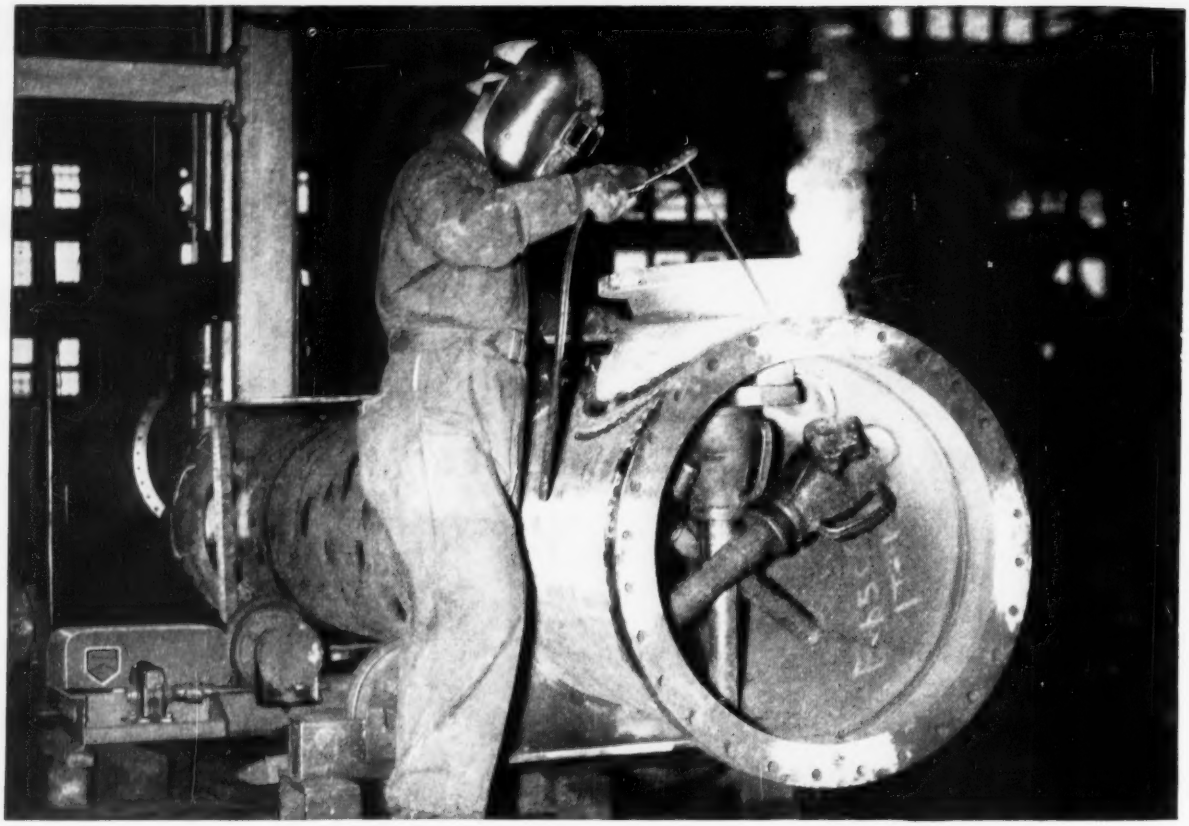
Radiography forestalls releasing imperfect castings—helps build reputations for consistently good work. This is why it is more and more becoming a routine procedure in many foundries.

If you'd like to know how Radiography can improve your own operations, discuss it with your x-ray dealer. Also send for a free copy of "Radiography as a Foundry Tool."

**EASTMAN KODAK COMPANY**
**X-ray Division, Rochester 4, N. Y.**

**Radiography...**
***another important function of photography***

Kodak
TRADE-MARK



# This welder can weld up to 50% more than he used to!

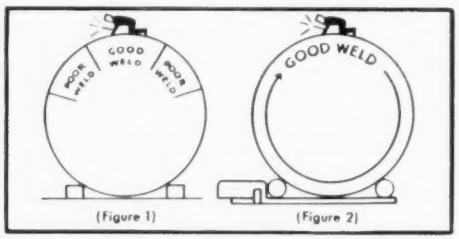
## *With Worthington turning rolls any welder can get better welds and turn out real footage*

No problem to boost welding footage as much as 50% when you use Worthington Turning Rolls.

Previously the welder was forced to waste lots of time by having to crawl over cylindrical vessels, turn them by hand or wait for crane and hoist service.

With Worthington Turning Rolls at work his footage is soaring and he produces neater, stronger welds with less effort. Now, *power* turns the vessel at any selected welding speed as he quickly spots longitudinal seams or continuously welds circumferential seams.

To find out where you can see a nearby Worthington Turning Roll, just ask us. For more data, ask for Bulletin 228. Worthington Corporation, Positioning Equipment Division, Plainfield, N. J.




WHY WORTHINGTON TURNING ROLLS INSURE BETTER WELDS

Unless the work is turned continuously, good downhand welding is obtainable only in small area (Fig. 1). With a Worthington Turning Roll, downhand welding is assured for the complete circumferential seam (Fig. 2) as well as all longitudinal seams (either by manual or automatic welding).

Y-21

**WORTHINGTON**

Welding Positioners
Turning Rolls

# Large or small INDUSTRIAL CUT GEARS

- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Mechanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

*ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.*

SPUR GEARS • BEVEL GEARS • MITRE GEARS WORMS • WORM GEARS RACKS PINIONS

SIMONDS GEARS

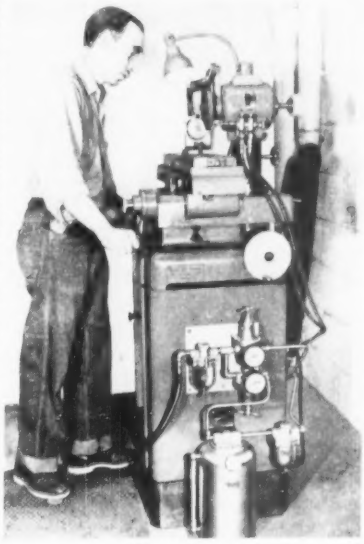
THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA.

*Quality Gears for over 60 years*


## NEW PRODUCTS and equipment

efficiently lubricates the cutting tool; it presents a greater exposed surface area of the oil particles, permitting more rapid withdrawal



of heat from the work area. Much smaller quantities of coolants or lubricants are required when using this application technique. C. A. Norgren Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

### Counterbores, Spot Facers

*. . . interchangeable pilots*

High speed steel counterbores and spot facers with interchangeable pilots have been added to Union's regular line of metal cutting tools.

Four styles of standard counterbores and spot facers are being

manufactured, long and short set in both straight and taper shank. Two additional styles are made especially for the aircraft industry. All styles are made with the cutter and shank integral and with the cutting edges well backed. Pilots


# STAMPINGS PILOT RUNS

**SPECIAL METHODS PRODUCE SMALL QUANTITIES AT MINIMUM COST.**

When you need just a few pieces — when you're still in the experimental stage—then an economical, cooperative source of parts is important.

Our **Machine-Cut Method** avoids custom die costs completely by use of special machinery which skillfully fashions pilot quantities.

Careful calculation determines the point at which labor costs warrant our **Short Run Method**, which uses simple contour dies and special purpose presses.

Best of all, when you get into large quantities on the experimental part, our STAMPINGS DIVISION is still your most economical producer, using our **Production Method**. Thus all three methods are at your disposal. And impartial choice of method *saves money* for you!

STAMPINGS DIVISION

LAMINATED SHIM COMPANY, INC.

3404 Union Street, Glenbrook, Conn.

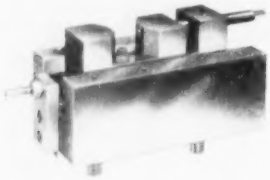
are carefully ground from high grade alloy steel and are manufactured in two styles, one style for the standard line another for aircraft work. Union Twist Drill Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

## Pinch Unit

*. . . eliminates distortion*

Horton Chuck announces a sliding pinch-type unit for holding thin walled parts in their "as-is" position on chucks or face plates.



Mounted in the T slots of a face plate or chuck, the units are workable in chucking setups for experimental first and second machining operations. It features a special floating arrangement for quick self-alignment to conform to the shape of the work piece. The jaws, having a pinching action, hold the piece ready for machining and minimize the distortion of thin wall pieces. It has a pinching capacity up to 1½ inches in thickness and its diameter capacity is limited only to the size of the chuck or face plate it is used upon. Norton Chuck Division, E. Horton & Son Co.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

## Stamping Calculator

*. . . for stamping specs*

Pertinent specifications for small and medium sized stampings may be determined with the inexpensive calculator placed on the market by Bao.

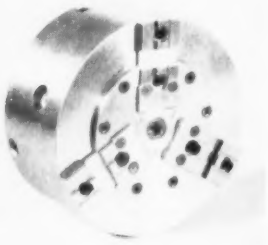
With a single setting, the calculator will give answers for: Blank diameters of cylindrical shells; number of drawing operations needed for producing the shell, as well as diameter and height of shell in successive draws; bending allowances for any stock thickness, inside bending radius and any bending angle; developed punch radius for over form; weight of any kind of material needed for making the stamping. Printed on Vinylite, the calculator measures 4 x 10 inches. It is accompanied by numerical examples to facilitate user's operation. Bao Slide Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

## Air Chuck

*. . . precise 0.001 inch*

The 12-inch Ajust - Tru Air Chuck, incorporating the precision principles of Buck Ajust-Tru scroll



chuck, will maintain precision within 0.001 inch.

The wedge-type actuated chuck claims four outstanding features: Great time saving in machining

Never too hot, never too heavy,
MAY-FRAN
Here's a conveyor belt built to take it . . . to last as long as the machinery it serves! Once installed, it's in to stay. MAY-FRAN engineers poured abrasive carborundum dust continuously on operating belt for a prolonged period of time . . . and it came through this grueling test still intact and serviceable!
You may not want to transport carborundum dust — but if you have foundry castings . . . die castings . . . hot forged
1748-MF
Outside links incorporate interlocking wings . . . remain positively engaged at all times. New interlocking flanges permit staggering of links . . . eliminate lateral movement.
MAY-FRAN

top jaws; accuracy; hardened top jaws can be used for long wear without the need to grind or regrind jaws when chucking or rechucking a job; it can be adjusted true under full line pressure. The chuck can be used on present equipment, but the company will also supply air cylinders on order. Buck Tool Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

## Magnetic Tape Recorder

*. . . facts on magnetic tape*

The Unityper II, an integral component of the Univac electronic data processing system, allows an efficient way to record facts on magnetic tape.

One reel of tape records more facts than 450 eighty or ninety-column punched cards. One operator can complete almost two full reels of magnetic tape in any average working day, changing tape in two minutes. The tape is reusable. The Unityper II will automatically erase all previously recorded information prior to recording current data. The unit will fit on any standard typewriting desk and is portable. Remington Rand Inc.

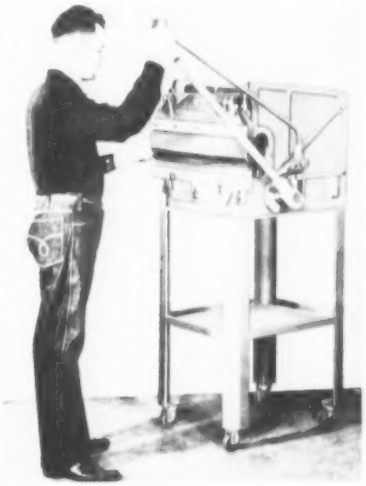
FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

## Press Brake

*. . . hand-operated, 8-ton capacity*

A 24-inch hand operated press brake rated at eight-ton capacity is said to incorporate a special cam lever mechanism which provides ample power for forming, blanking, piercing, drawing and trimming operations plus a ratchet drive system that greatly multiplies the power for heavy forming jobs.

Primarily designed to relieve large production models of short run forming operations, it is compact enough to be quickly set up for use in experimental engineering and model shops. The Di-Arco Press Brake will form 16-gage mild sheet steel across the full 24-inch forming width, 10-gage




never too abrasive for...

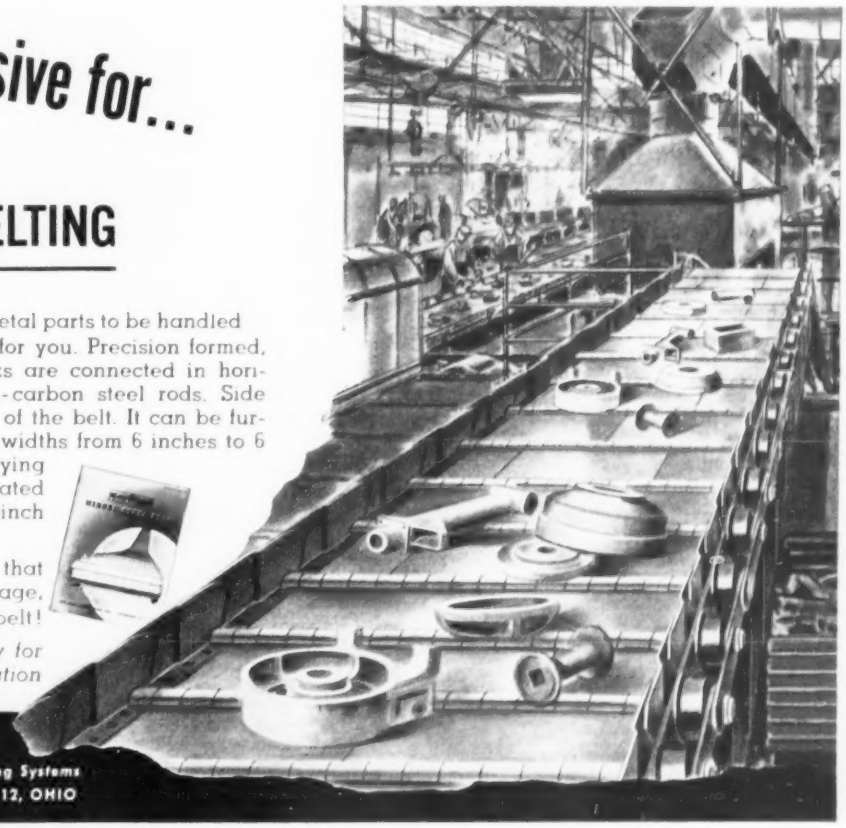
HINGED-STEEL BELTING

items...hot, heavy or abrasive metal parts to be handled MAY-FRAN hinged-steel belt is for you. Precision formed, heavy-gauge hinged-steel links are connected in horizontal rows by means of high-carbon steel rods. Side chains become an integral part of the belt. It can be furnished to your specifications in widths from 6 inches to 6 feet and in any length or carrying capacity. Both solid and perforated links are available in 2½ to 12-inch pitch lengths.



If you want conveyor belting that can withstand the roughest usage, specify MAY-FRAN hinged-steel belt!

*Write today for complete information*



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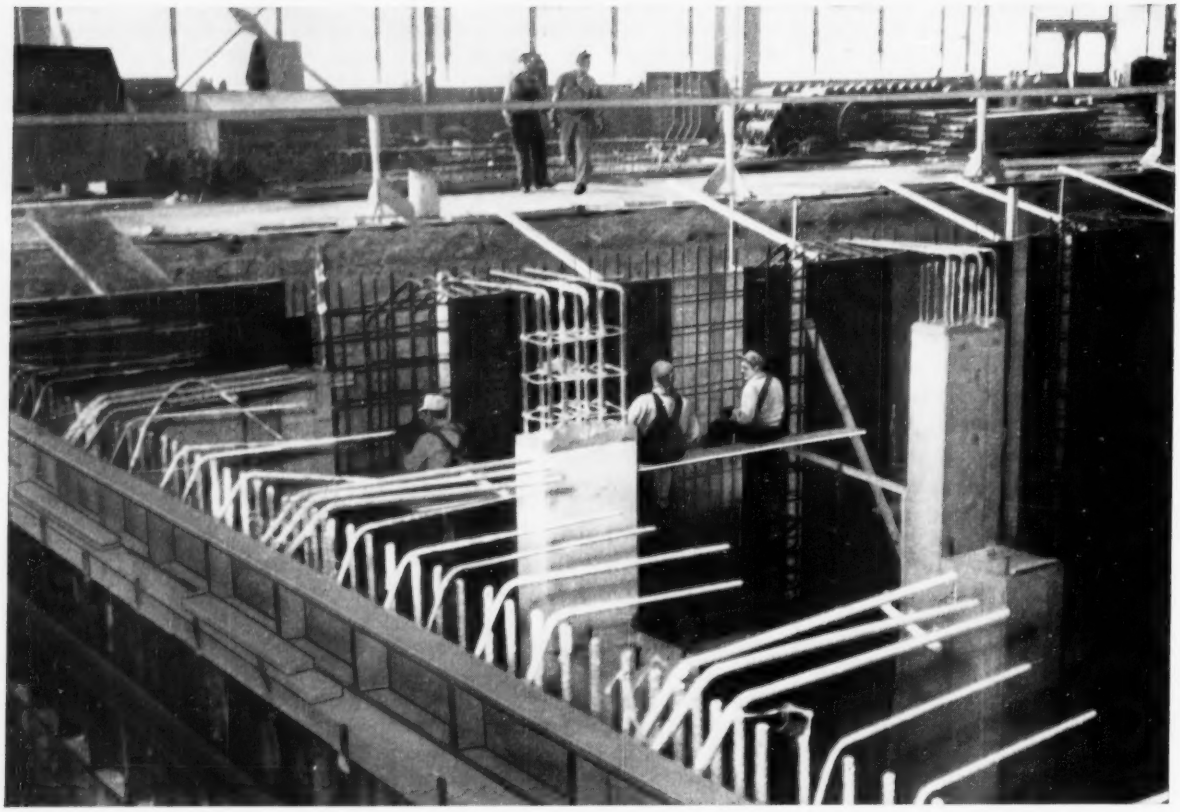
Designers and Builders of Complete Handling Systems
1725 CLARKSTONE ROAD • CLEVELAND 12, OHIO



# *It costs no more to employ a specialist!*

CONSTRUCTING A DEEP FOUNDATION for a heavy press or making other alterations in a busy plant, without disrupting production, requires special skill.

Commercial Contracting Corporation excels in projects of this kind, and has built an enviable reputation for doing quality work — quickly and economically.

Every detail is planned in advance. Every contingency is analyzed. All equipment, manpower, and materials arrive at the site according to a predetermined schedule.

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Whether your project is large or small, every aspect of the work will be supervised by experts, expedited by top management.

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**General Construction • Building Alterations • Demolition • Foundations • Machinery Installing Press Erecting • Crane and Conveyor Installing • Equipment Warehousing Machinery Moving • Steel Fabricating • Export Packaging**

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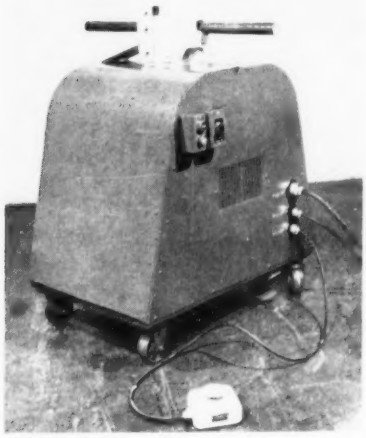
mild sheet steel across a 12-inch forming width as well as inconel, brass, aluminum, stainless steel, chrome molybdenum and all other ductile materials. O'Neil-Irwin Mfg. Co.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

## Portable Shear

*. . . can cycle automatically*

The development of a hydraulic cutter, the H-90 Guillotine Shear, designed for cold drawing operations and adaptable to forging bar cutoff requirements is announced by Manco. Weight is 950 pounds.



A square cut is obtained on all types of steel bar up to $1\frac{1}{2}$ inches round. Operation is electric hydraulic, with cutoff time 2 seconds. A complete cycle is performed by touch of hand or foot switch. Portable, no concrete foundation is required. Height is 48 inches. Interchangeable dies in 1/16-inch increments are available. Manco Mfg. Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

## Electrolimit Gage

*. . . for continuous gaging*

Developed originally for cold rolling mills, the model D electrolimit continuous gage can now be applied to centerless grinders for the continuous gaging of precision ground bar stock.

With the addition of control circuits to the gage, an off-tolerance signal can be provided to shut down the machine, signal the oper-

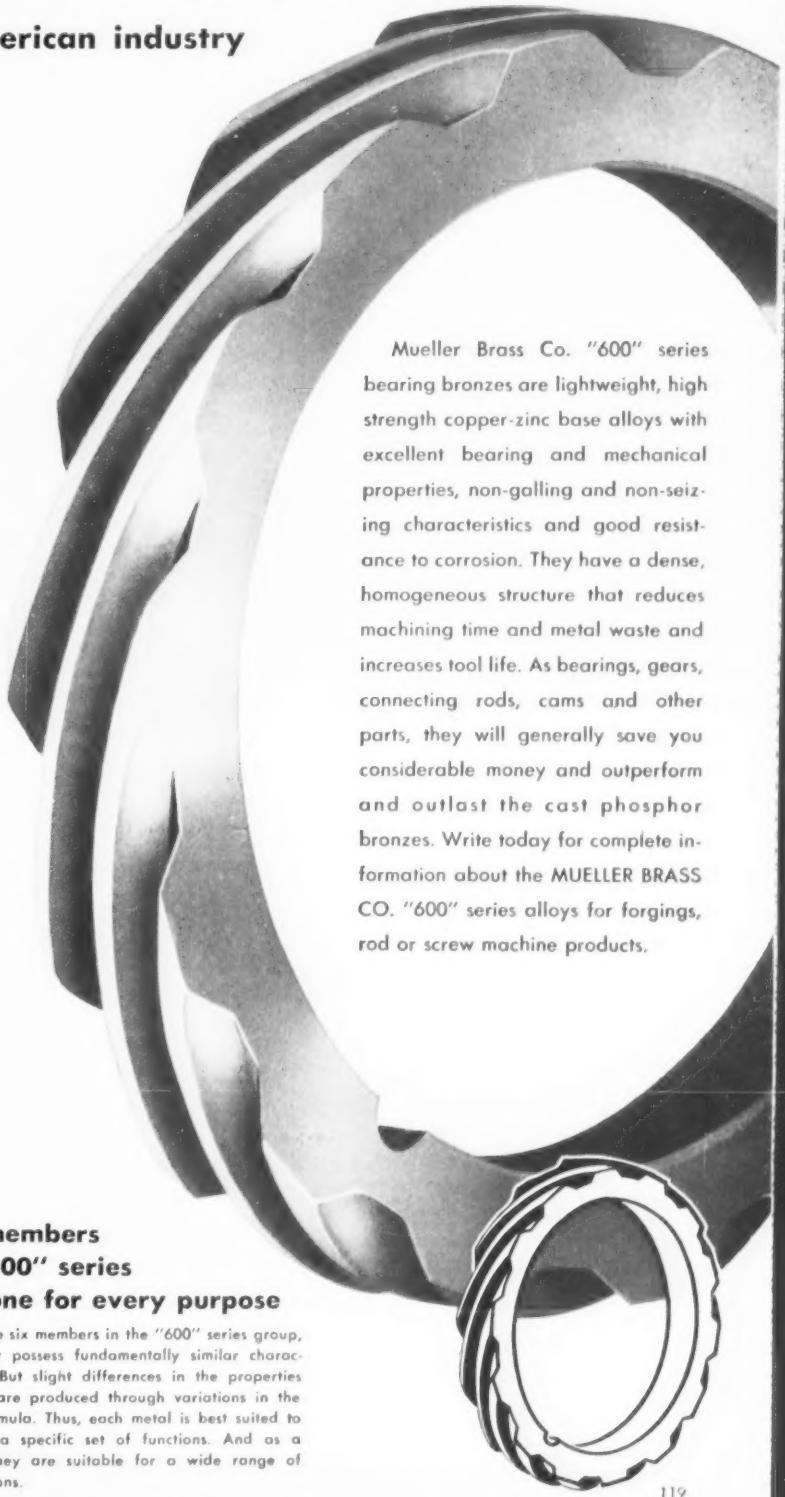



# MUELLER BRASS CO.

# 600 SERIES BEARING ALLOYS

**FORGINGS • ROD • SCREW MACHINE PRODUCTS**

**proving their quality throughout American industry**



Mueller Brass Co. "600" series bearing bronzes are lightweight, high strength copper-zinc base alloys with excellent bearing and mechanical properties, non-galling and non-seizing characteristics and good resistance to corrosion. They have a dense, homogeneous structure that reduces machining time and metal waste and increases tool life. As bearings, gears, connecting rods, cams and other parts, they will generally save you considerable money and outperform and outlast the cast phosphor bronzes. Write today for complete information about the MUELLER BRASS CO. "600" series alloys for forgings, rod or screw machine products.

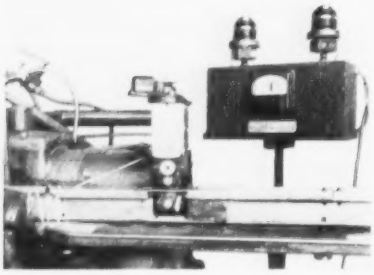
**six members of "600" series . . . one for every purpose**

There are six members in the "600" series group, and they possess fundamentally similar characteristics. But slight differences in the properties of each are produced through variations in the basic formula. Thus, each metal is best suited to perform a specific set of functions. And as a group, they are suitable for a wide range of applications.

119

**MUELLER BRASS CO.** PORT HURON 19, MICHIGAN

ator, or provide feed-back impulses for controlling the machine automatically, if the machine is designed for such controls. It is direct-setting, with a measuring gage employing a counter for setting directly to 0.0001 inch and



a meter for reading plus and minus deviations from the setting to 0.0001 inch. It is adaptable to any ½-inch range. Pratt & Whitney, division of Niles-Bement-Pond Co.

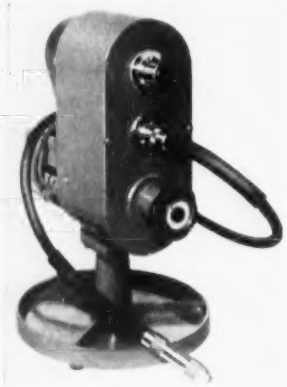
FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

### Hand Grinder

*. . . from 700 to 50,000 rpm*

A hand grinder has been developed which will vary speed from 700 to 50,000 rpm.

Ultra-Flex is a 1-hp, three-phase motor with a V-belt pulley drive. It has the advantage of operating accurately at selected speed, even under a full load. The wide ranges



of speed are manipulated by a hand dial which controls the flexible drive shaft. The grinder will actuate carbide burrs, mounted wheels, abrasive discs, buffing wheels and grinding wheels from 1/16 inch to 7 inches in diameter. Metal Removal Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

# FREE LITERATURE

## Catalogs and Clip Sheets

**Reply card on page 159 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue**

### Lift Truck

Towmotor Corp.—Job Study No. 130 covers performance of one of Towmotor's lift trucks. The survey shows in words and pictures how modern mass handling is saving $50,000 a year for a heavy chemicals manufacturer. On-the-spot photos illustrate simple handling techniques applicable to industry in general.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

### Blast Cleaning

Pangborn Corp. — A 28-page booklet describes accessories and supplies available from Pangborn for use with their blast cleaning equipment. The book includes engineering selection data as well as specifications. Several pages are devoted to correct selection of abrasives according to cleaning requirements.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

### Forging Ahead

American Car & Foundry Co.—"Forging Ahead" is the story of a complete industrial forging service. Contents include forging facilities at work, a picture history with brief description and 25 pages devoted to process. Included is a schematic layout of the A.C.F. forge shop.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

### Pillar Presses

Waterbury Farrell Foundry & Machine Co.—Extensive information on the company's modernized line of multiple plunger pillar presses is given in an 8-page folder. Complete specifications and capacities are listed in tabular form for six sizes of presses. Several sizes of the machines are illustrated with examples of the type of work produced.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

### Thread Rolling Attachment

Landis Machine Co.—A brochure describing the new Lanroll thread rolling attachment is available from Landis. 8 pages cover the product for application to automatic screw machines. Detailed text is supported by a number of illustrations.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

### Batch Cleaning

Magnus Chemical Co. Inc.—8-page bulletin, "Metal Parts Batch Cleaned In Minutes," describes the Magnus Aja-Lif cleaning machines. The new bulletin elaborates on the importance of mechanical agitation in parts cleaning and fully describes the outstanding features of the machines.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

### Iron-Powder Parts

Pow-Met Industries Inc.—Pow-Met offers a 4-page brochure covering high-density iron powder parts. A graph illustrates the physical properties obtained when iron powder compacts are compressed initially to the higher densities.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

### Yard Shovel

American Hoist & Derrick Co.—A descriptive catalog on the new 1½-yard shovel, 35-ton crane is offered by American Hoist. Action pictures of the machine in typical job conditions are included. General specifications are listed.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

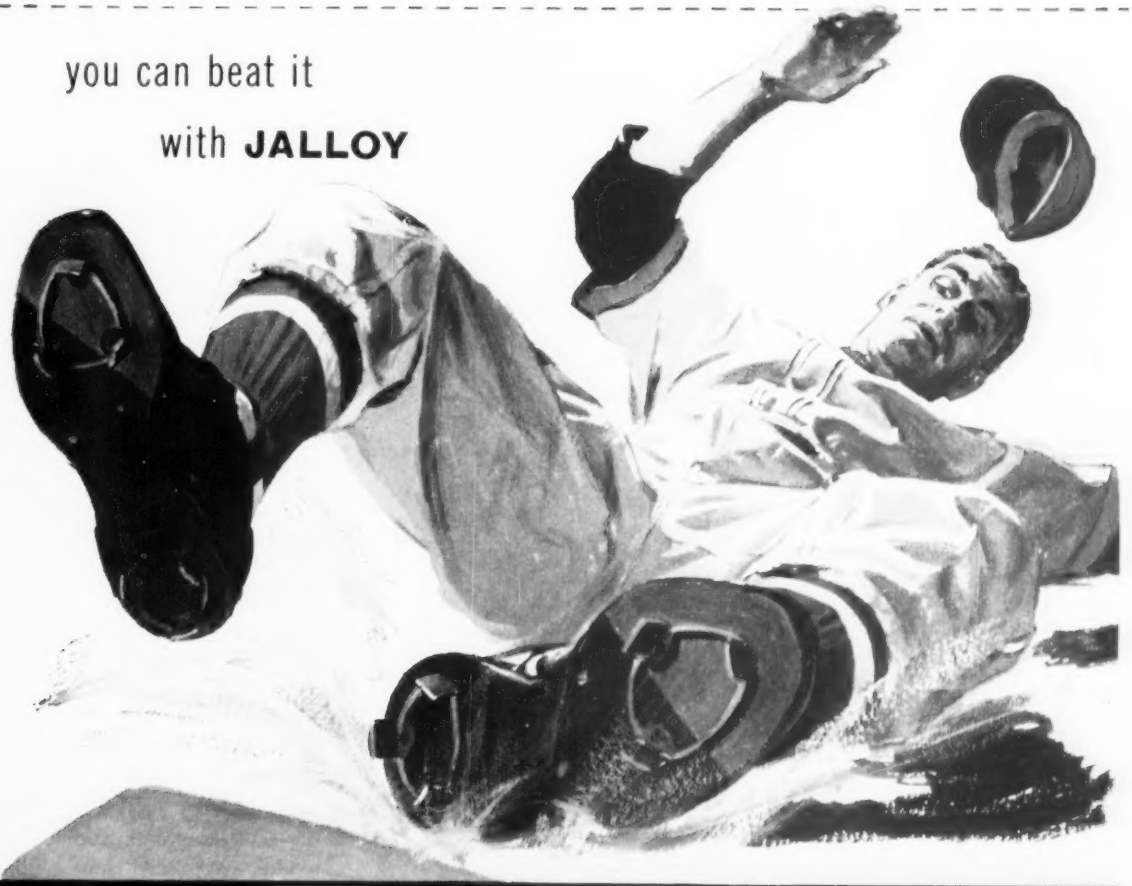
### Impact Data

International Nickel Co. Inc.—Bulletin A-165 lists impact data from tests at room temperature, −105° and −320°F of various types of stainless steel plate and

# FACING A TOUGH PROPOSITION?

you can beat it

with **JALLOY**



**J&L JALLOY HEAT-TREATED PLATE BEATS WEAR DUE TO ABRASION**

Jalloy lowers maintenance costs on coal conveyors

Jalloy provides longer wear with less repair in truck bodies

Jalloy Plates outlast other steels by margins of 4 to 1

Jalloy Aprons in Tyrock screens last 3 times as long as other steels

J&L Jalloy Heat-Treated Plate is the general purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

Jalloy is available in three grades to meet various service requirements.

J&L STEEL

*Jones & Laughlin*

STEEL CORPORATION — *Pittsburgh*

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

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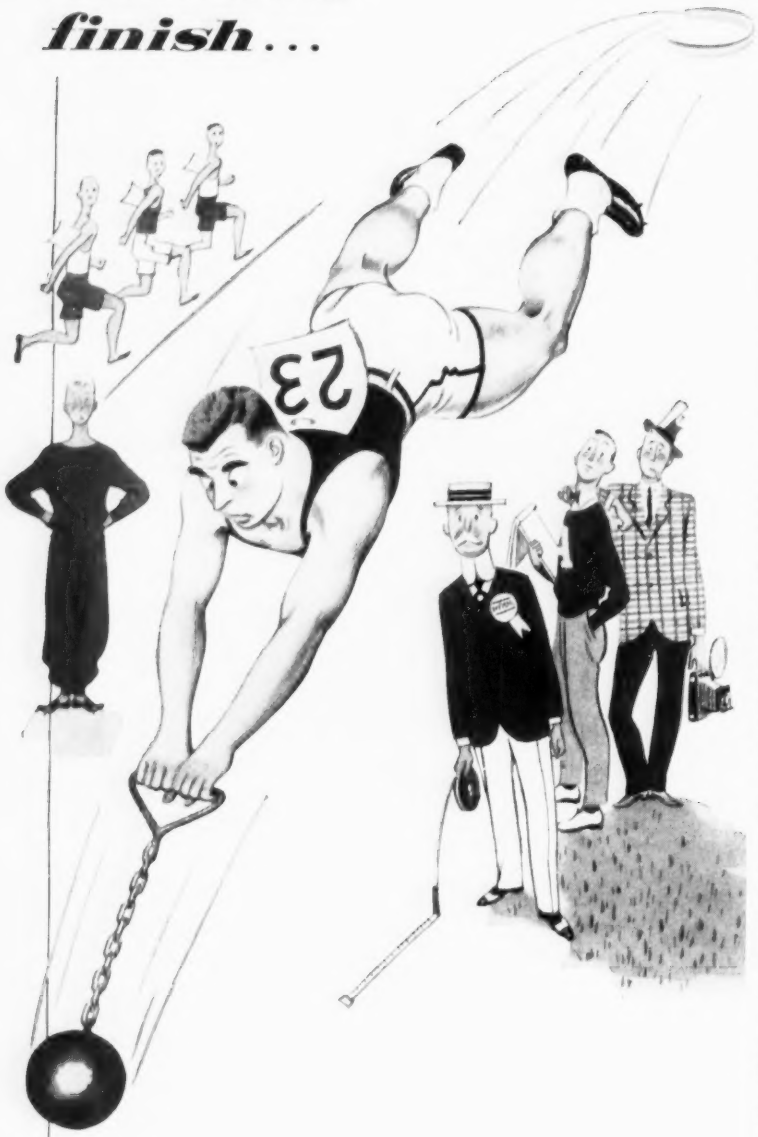


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*For grinding, smoothing, polishing — metal, wood, leather, plastics, rubber. A grit for every purpose — prompt service on every purchase.*

**ABRASIVE PRODUCTS, INC.**
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South Braintree 85, Massachusetts

weld metal. The data permits comparison of the effect of weld rods of different analyses and the effect of heat treatments. Weld metals tested include AISI types 301, 302, 304, 308, 310, 316, 317, 318 and 347.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

### Entrainment Burners

Eclipse Fuel Engineering Co.—Eclipse has issued a 4-page bulletin covering piloted entrainment burners. Complete information concerning construction and specifications, together with diagrams and charts, is furnished for the series 16 PB and 20 PB burners and the series 24 PBE burner.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

### S Monel Properties

International Nickel Co. Inc.—Technical Service Section offers a new technical booklet on the engineering properties of S Monel. Seven pages cover physical properties in detail. Its strength, hardness and antigalling properties at temperatures up to 1100 F and corrosion resistiveness are pointed out.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

### Air Chucks

Whiton Machine Co.—Two types of air chucks and an improved air cylinder are covered in an 8-page brochure. Also described is the Whiton Micro jaw-set, an accessory providing precision adjustment of chucks having American Standard serrated type jaws. Wedge-actuated and lever-actuated chucks are described in detail.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

### Heating Pipelines

General Electric Co.—An 8-page bulletin on heating pipelines describes the numerous pipeline applications of G-E Calrod tubular heaters in industry. It provides a comprehensive chart showing heat losses of vertical, solid, smooth surfaces of various metals.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

### Valve Body Specs

Minneapolis-Honeywell Regulator Co.—Industrial Division offers Bulletin 1701, replacing catalog 1700. It contains specifications of continental butterfly valve bodies and the series 800 diaphragm motor operators. Tables of allowable

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pressure differentials are included to facilitate selection of properly-sized bodies and operators.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

### Differential Drill Unit

Douglas Tool Co.—Douglas offers a 4-page brochure on their differential drill unit. A diagram is included with a brief description of the machine's working parts. Specifications are covered.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

### Drop Forging

Billings & Spencer Co.—An informative booklet on drop forging contains a brief history of Billings & Spencer, a short description of how drop forgings are made and useful information on methods for producing drop forgings. It is designed to familiarize users of commercial drop forgings with the company.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

### Barrel Finishing

Abbot Ball Co. Abbot method of barrel finishing and an improved tumbling barrel are fully described in a four-color, 6-page brochure. Intended to familiarize tumbling barrel users with a method of finishing employing use of steel balls and shapes, the brochure also details the revised Abbot vertical barrel with base-mounted motor, gear reduction drive and Color Dynamics finish.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

### Bearing Application

Thompson Industries Inc. A chart designed to enable engineers to evaluate their bearing functions with respect to 17 service requirements is offered by the Engineering Department. The chart lists 17 basic performance and application elements to be considered in bearing selection. It is designed so that various types of bearings may be listed and evaluated.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

### Electric Oil Heaters

Hauck Mfg. Co.—Catalog No. 709A includes capacity ratings of electric oil heaters for sizes from 2 up to and including 64 kw. Advantages of the Hauck oil suction heater are covered, plus the method of automatic operation. Illustrations include a heating rate table.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

### Standby Power

D. W. Onan & Sons Inc.—A folder, describing the complete line of Onan standby electric plants, is offered. It describes the wide selection of special emergency electric generating plants that meet the rigid code of approval of the Pennsylvania Industrial Board. Gas and gasoline driven models are illustrated. Several plant installations are shown.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

### Cutting, Grinding Procedure

Master Chemical Corp.—Master Chemical's brochure contains a pocket-size 44-page booklet on cutting and grinding procedures. Both the brochure and the booklet contain charts and graphs showing recommended concentrations for machining different metals in all metalworking operations.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

### Bearings

American Brake Shoe Co. The National Bearing Division has published a 24-page illustrated booklet that presents the division's cast bronze and copper products for general industry. An alloy chart lists composition, analyses,

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below

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properties and applicable specifications of National's copper, babbitt, bronze and aluminum alloys.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

### Quantometers

Applied Research Laboratories—A 7-page booklet covers optical emission quantometers and their function in modern industry. What they do and how they operate are considered thoroughly. Specifications for the 2 meter and 1.5 meter quantometers are listed.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

### V-Belt Drives

Allis-Chalmers Mfg. Co.—A six page interim bulletin providing, in condensed form, necessary information on the new method of calculating the horsepower capacity of a Texrope V-belt drive is offered. The new formula provides means of determining ratings for both standard-construction and high-capacity belts.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

### Integrated Tank Building

Reed Engineering Co.—A catalog for producers interested in welding or in tank production is offered by Reed. 15-pages cover a complete line of machines and fixtures built exclusively for the tank fabricator. Designed for use with manual, semi-automatic or fully-automatic welding processes, these machines are built to use welded steel construction wherever possible.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

### Water-Repellent Compounds

Dewey & Almy Chemical Co.—Construction Specialties Division offers a technical brochure describing theory, application and benefits of special silicone resin water-repellent compounds for above-grade exterior masonry. Included are comparative ratings of various water repellents on the market, with job specifications.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

### Air Preheater

Air Preheater Corp.—36 pages explain the fuel savings and increased performance made possible by using waste heat in flue gases to preheat incoming combustion air. The booklet also contrasts regenerative with recuperative preheaters and explains the operating principle and structural details and advantages of the Ljungstrom Air Preheater, a gas-to-gas preheater of the continuous regenerative type.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

### Milling Machine

Elgin Tool Works—Elgin's bench type milling machine is described in a catalog offered by the company. Specifications and special features of the machine are covered, with a list of accessories available.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

## EDITORIAL REPRINTS:

### Now You Have to Sell

No. 1 in STEEL's 1954 Program for Management series, "Now You Have To Sell," emphasizes that better selling is the best answer to rising competition. The 8-page article points up specific areas for attention in realizing sales potentials.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

### Build Better Bosses

No. 2 in the Management Series, "Build Better Bosses," shows how planned management development serves the twin function of increasing executive and supervisory competence in today's fight for profits and providing reserves for future growth.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

### Machining Stainless

J. D. Armour, Union Drawn Steel Division, Republic Steel Corp., offers a guide for machining stainless steels. He says the user must balance values: Some free-machining types approach workability of bessemer screw stock; non-free machining types offer top mechanical corrosion properties.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

### New Life for Press

The conventional rubber pad press has been given new muscles. With a working pad displaced down over work by pumping hydraulic oil into a fluid cell, more complete forming results, because both the face and wide pressures are uniform. A STEEL article discusses the method.

FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

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STEEL

April 5, 1954

# Market Outlook

THE FIRST rise in steel ingot production since Feb. 21 was recorded in the week ended Apr. 4.

The rise was 1 point from a revised rate and put the week's pace at 69 per cent of capacity, highest since the week ended Mar. 7.

Not all districts made increases, but some showed sharp enough improvements to slightly more than offset declines in others.

**HEADWAY**—In the St. Louis district, one showing sharp increases, the recovery stems from Granite City Steel Co., which doubled its ingot production as inventories of semifinished steel reached a level of normal or slightly below after a month-long deliberate workdown. Needlessly large inventories have been blamed for much of the current business slowdown. Not only did steel consumers have large inventories but so did many of the steel producers. It has been commonly asserted that there would not be a business revival until inventory reductions have been accomplished. Granite City Steel gives evidence that such inventory reduction has been attained by it, and the result there is a doubling of ingot production.

In the Chicago area, a steelmaker now concludes it has moved too far in reducing its semifinished inventory. Consequently, its operations in the next two or three weeks will reflect corrective measures.

**ENCOURAGING**—A further upturn in steel production is forecast by a survey by Solar Steel Corp., a nationwide steel warehouse firm with general offices in Cleveland. It found that steel purchasing by the metalworking industry will increase around 36 per cent above the February level by May 15 if expectations of executives of a large segment of the country's metalworking industry are realized fully. The survey was based upon reports from 240 steel consuming companies.

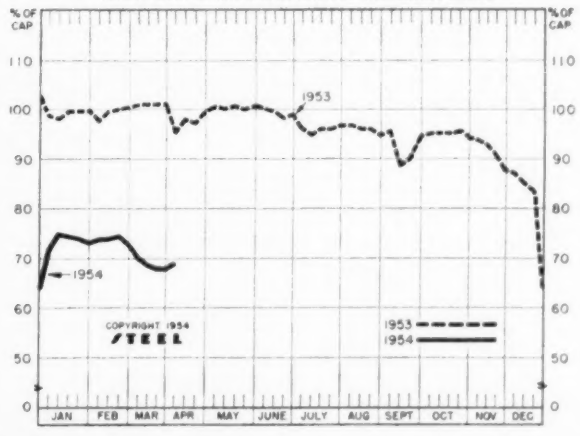
The survey further indicated that by Apr. 15 steel purchasing will have increased almost 20 per cent over February.

**WHERE THEY STAND**—Thirty-seven per cent of the firms reported their steel inventories in February of this year were higher than in the corresponding month of last year, 29 per cent said they had reduced inventories, and 34 per cent reported no significant change. The average increase reported in steel inventories in February over a year ago was roughly 14 per cent. Their steel purchases in February of this year ran 30 per cent below the 1953 peak.

**HIGHER DEMAND**—Judging from inquiries out now for general requirements, the Navy and other government services will buy more steel in April than they averaged per month in the first quarter of this year.

**ON THE JOB**—The aim to capture every possible order may produce a new vacation policy in steel plants during the coming summer. During the last several years of hectic steel buying, some of the steel plants have closed for mass vacations. They wouldn't miss any business, because all of the companies had all they could handle anyway. Now it's learned that a leading producer of wire will not close for vacation this summer. Vacations will be staggered and production maintained so that prompt delivery can be given any order received.

## NATIONAL STEELWORKS OPERATIONS




## DISTRICT INGOT RATES

(Percentage of capacity engaged)

| | Week Ended Apr. 4 | Change | Same Week 1953 | Same Week 1952 |
|---|---|---|---|---|
| Pittsburgh | 73 | + 1* | 78 | 103 |
| Chicago | 77 | + 0.5* | 107.5 | 104 |
| Mid-Atlantic | 61 | 0 | 97 | 99 |
| Youngstown | 70 | + 4 | 106 | 103 |
| Wheeling | 67.5 | + 2.5 | 101 | 100 |
| Cleveland | 57 | + 3 | 99 | 102 |
| Buffalo | 67.5 | + 2.5* | 106.5 | 104 |
| Birmingham | 75.5 | + 2.5 | 99 | 102 |
| New England | 65 | + 8 | 92 | 84 |
| Cincinnati | 67 | 0 | 97 | 94 |
| St. Louis | 62 | + 10 | 81 | 86.5 |
| Detroit | 89 | 0* | 107 | 106 |
| Western | 76 | 0 | 112 | 102 |
| National Rate | 69 | + 1* | 95 | 102 |

## INGOT PRODUCTION‡

| | Week Ended Apr. 4 | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| INDEX (1947-1949=100) | 100.9 | 101.1 | 105.0 | 136.3 |
| NET TONS (In thousands) | 1,621 | 1,624 | 1,686 | 2,190 |

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

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# PRICE INDEXES AND COMPOSITES

## AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Mar. 30

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rails, standard, No. 1 | $4.400 | Bars, H.R., alloy | $8.575 | Strip, C.R., stainless, 430 (lb) | $0.415 | Tin plate, hot-dipped, 1.25 lb | $8.438 |
| Rails, light, 40 lb | 5.767 | Bars, H.R., stainless, 303 (lb) | 0.418 | Strip, H.R., carbon | 4.975 | Tin plate, electrolytic, 0.25 lb | 7.133 |
| Tie Plates | 5.125 | Bars, H.R., carbon | 4.873 | Pipe, black, buttweld (100 ft) | 14.464 | Black plate, can making quality | 6.233 |
| Axles, railway | 7.250 | Bars, reinforcing | 4.900 | Pipe, galv., buttweld (100 ft) | 17.731 | Wire, drawn, carbon | 7.713 |
| Wheels, freight car, 33 in. (per wheel) | 47.000 | Bars, C.F., carbon | 7.960 | Pipe, line (100 ft) | 141.960 | Wire, drawn, stainless, 430 (lb) | 0.545 |
| Plates, carbon | 4.550 | Bars, C.F., alloy | 11.000 | Casing, oil well, carbon (100 ft) | 149.616 | Bale ties (bundle) | 5.653 |
| Structural Shapes | 4.367 | Bars, C.F., stainless, 302 (lb) | 0.433 | Casing, oil well, alloy (100 ft) | 214.113 | Nails, wire, 8d common | 7.488 |
| Bars, tool steel, carbon (lb) | 0.415 | Sheets, H.R., carbon | 4.765 | Tubes, boiler (100 ft) | ‡ | Wire, barbed (80-rod spool) | 6.834 |
| Bars, tool steel, alloy, oil hardening die (lb) | 0.505 | Sheets, C.R., carbon | 5.704 | Tubing, mechanical, carbon (100 ft) | ‡ | Woven wire fence (20-rod roll) | 16.147 |
| Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb) | 1.075 | Sheets, galvanized | 6.945 | Tubing, mechanical, stainless, 304 (100 ft) | 161.193 | ‡ Not available. | |
| Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb) | 1.550 | Sheets, C.R., stainless, 302 (lb) | 0.548 | | | | |
| | | Sheets, electrical | 9.000 | | | | |
| | | Strip, C.R., carbon | 7.243 | | | | |

## FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

| | Mar. 30 1954 | Mar. 23 1954 | Month Ago | Mar. Average |
|---|---|---|---|---|
| (1947-1949=100) | 140.9 | 140.9 | 141.0 | 140.9 |

## STEEL's FINISHED STEEL PRICE INDEX*

| | Apr. 1 1954 | Week Ago | Month Ago | Year Ago | 5 Yrs. Ago |
|---|---|---|---|---|---|
| Index (1935-39 av.=100) | 189.74 | 189.74 | 189.74 | 181.31 | 154.85 |
| Index in cents per lb | 5.140 | 5.140 | 5.140 | 4.912 | 4.195 |

## STEEL's ARITHMETICAL PRICE COMPOSITES

| | Apr. 1 1954 | Week Ago | Month Ago | Year Ago | 5 Yrs. Ago |
|---|---|---|---|---|---|
| Finished Steel, NT* | $113.73 | $113.73 | $113.91 | $110.98 | $96.68 |
| No. 2 Fdry Pig Iron, GT | 56.54 | 56.54 | 56.54 | 55.04 | 46.63 |
| Basic Pig Iron, GT | 56.04 | 56.04 | 56.04 | 54.66 | 46.22 |
| Malleable Pig Iron, GT | 57.27 | 57.27 | 57.27 | 55.77 | 47.34 |
| Steelmaking Scrap, GT | 24.50 | 24.33 | 24.50 | 43.75 | 30.33 |

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

# COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

| FINISHED STEEL | Apr. 1 1954 | Week Ago | Month Ago | Year Ago | 5 Yrs. Ago |
|---|---|---|---|---|---|
| Bars, H.R., Pittsburgh | 4.15 | 4.15 | 4.15 | 3.95 | 3.35 |
| Bars, H.R., Chicago | 4.15 | 4.15 | 4.15 | 3.95 | 3.35 |
| Bars, H.R., del. Philadelphia | 4.405 | 5.302 | 5.302 | 4.502 | 3.816 |
| Bars, C.F., Pittsburgh | 5.20 | 5.20 | 5.20 | 4.925 | 3.95 |
| Shapes, Std., Pittsburgh | 4.10 | 4.10 | 4.10 | 3.85 | 3.25 |
| Shapes, Std., Chicago | 4.10 | 4.10 | 4.10 | 3.85 | 3.25 |
| Shapes, del., Philadelphia | 4.38 | 4.38 | 4.38 | 4.13 | 3.492 |
| Plates, Pittsburgh | 4.10 | 4.10 | 4.10 | 3.90 | 3.50 |
| Plates, Chicago | 4.10 | 4.10 | 4.10 | 3.90 | 3.40 |
| Plates, Coatesville, Pa. | 4.10 | 4.10 | 4.10 | 4.85 | 3.75 |
| Plates, Sparrows Point, Md. | 4.10 | 4.10 | 4.10 | 3.90 | 3.45 |
| Plates, Claymont, Del. | 4.10 | 4.10 | 4.10 | 4.35 | 3.95 |
| Sheets, H.R., Pittsburgh | 3.925 | 3.925 | 3.925 | 3.775 | 3.275 |
| Sheets, H.R., Chicago | 3.925 | 3.925 | 3.925 | 3.775 | 3.25 |
| Sheets, C.R., Pittsburgh | 4.775 | 4.775 | 4.775 | 4.575 | 4.00 |
| Sheets, C.R., Chicago | 4.775 | 4.775 | 4.775 | 4.575 | 4.00 |
| Sheets, C.R., Detroit | 4.975 | 4.975 | 4.975 | 4.775 | 4.20 |
| Sheets, Galv., Pittsburgh | 5.275 | 5.275 | 5.275 | 5.075 | 4.40 |
| Strip, H.R., Pitts. | 4.425 | 4.425 | 4.425 | 3.975-4.225 | 3.275 |
| Strip, H.R., Chicago | 3.925 | 3.925 | 3.925 | 3.725 | 3.25 |
| Strip, C.R., Pittsburgh | 5.45 | 5.45 | 5.45 | 5.10-5.80 | 4.375 |
| Strip, C.R., Chicago | 5.70 | 5.70 | 5.70 | 5.35 | 4.00 |
| Strip, C.R., Detroit | 5.45-6.05 | 5.45-6.05 | 5.45-6.05 | 5.30-6.05 | 4.45 |
| Wire, Basic, Pitts. | 5.525 | 5.525 | 5.525 | 5.225-5.475 | 4.15 |
| Nails, Wire, Pittsburgh | 6.55 | 6.55 | 6.55 | 6.35 | 5.20 |
| Tin plate (1.50 lb), box, Pitts. | $8.95 | $8.95 | $8.95 | $8.95 | $7.75 |
| **SEMIFINISHED STEEL** | | | | | |
| Billets, forging, Pitts. (NT) | $75.50 | $75.50 | $75.50 | $70.50 | $61.00 |
| Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts. | 4.525 | 4.525 | 4.525 | 4.425 | 3.775 |

| PIG IRON, Gross Ton | Apr. 1 1954 | Week Ago | Month Ago | Year Ago | 5 Yrs. Ago |
|---|---|---|---|---|---|
| Bessemer, Pitts. | $57.00 | $57.00 | $57.00 | $55.50 | $48.08 |
| Basic, Valley | 56.00 | 56.00 | 56.00 | 54.50 | 46.00 |
| Basic, del. Phila. | 59.66 | 59.66 | 59.66 | 59.25 | 50.30 |
| No. 2 Fdry, Pitts. | 56.50 | 56.50 | 56.50 | 55.00 | 47.58 |
| No. 2 Fdry, Chicago | 56.50 | 56.50 | 56.50 | 55.00 | 46.25 |
| No. 2 Fdry, Valley | 56.50 | 56.50 | 56.50 | 55.00 | 46.50 |
| No. 2 Fdry, del. Phila. | 60.16 | 60.16 | 60.16 | 59.75 | 50.80 |
| No. 2 Fdry, Birm. | 52.88 | 52.88 | 52.88 | 51.38 | 43.35 |
| No. 2 Fdry (Birm.) del. Cin. | 60.43 | 60.43 | 60.43 | 58.93 | 49.43 |
| Malleable, Valley | 56.50 | 56.50 | 56.50 | 55.00 | 46.50 |
| Malleable, Chicago | 56.50 | 56.50 | 56.50 | 55.00 | 46.50 |
| Ferromanganese, Duquesne | 290.00† | 290.00† | 290.00† | 228.00* | 175.00* |

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

| SCRAP, Gross Ton (Including broker's commission) | | | | | |
|---|---|---|---|---|---|
| No. 1 Heavy Melt, Pitts. | $25.50 | $25.50 | $28.50 | $44.00 | $32.50 |
| No. 1 Heavy Melt, E. Pa. | 22.00 | 22.00 | 23.00 | 44.50 | 27.50 |
| No. 1 Heavy Melt, Chicago | 26.00 | 25.50 | 25.00 | 42.75 | 31.00 |
| No. 1 Heavy Melt, Valley | 23.50 | 23.50 | 23.50 | 44.25 | 29.25 |
| No. 1 Heavy Melt, Cleve. | 20.50 | 20.50 | 20.50 | 44.25 | 28.25 |
| No. 1 Heavy Melt, Buffalo | 24.00 | 24.00 | 25.00 | 47.00 | 30.50 |
| Rails, Rerolling, Chicago | 34.50 | 34.50 | 36.50 | 56.00 | 39.50 |
| No. 1 Cast, Chicago | 36.00 | 33.00 | 30.50 | 44.00 | 34.50 |
| **COKE, Net Ton** | | | | | |
| Beehive, Furn, Connlsvl. | $14.75 | $14.75 | $14.75 | $14.75 | $14.50 |
| Beehive, Fdry, Connlsvl. | 16.75 | 16.75 | 16.75 | 17.00 | 17.00 |
| Oven Fdry, Chicago | 24.50 | 24.50 | 24.50 | 24.50 | 20.40 |

# NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

## PRIMARY METALS AND ALLOYS

**Aluminum:** 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

**Aluminum Alloy:** No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

**Antimony:** R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

**Beryllium:** 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

**Beryllium Aluminum:** 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

**Beryllium Copper:** 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

**Bismuth:** $2.25 per lb, ton lots.

**Cadmium:** Sticks and bars, $1.70 per lb del.

**Cobalt:** 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

**Columbium:** Powder, $75.00 per lb, nom.

**Copper:** Electrolytic 29.75-30.00 del. Conn. Valley, 29.875-30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

**Germanium:** 99.9%, $295 per lb nom.

**Gold:** U. S. Treasury, $35 per oz.

**Indium:** 99.9%, $2.25 per troy oz.

**Iridium:** $145-$150 per troy oz.

**Lead:** Common 13.55, chemical 13.65, corroding 13.65, St. Louis; New York basis, add 0.20.

**Lithium:** 98%, $11-$14 per lb, depending on quantity.

**Magnesium:** 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

**Magnesium Alloys:** AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

**Mercury:** Open market, spot, New York, $205-$208 per 76-lb flask.

**Molybdenum:** Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.00 per lb; sintered ingot $5.53 per lb.

**Nickel:** Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

## DAILY NONFERROUS PRICE RECORD

| | Price Apr. 1 | Change | Previous Price | Feb. Avg. | Jan. Avg. | Mar. 1953 Avg. |
|---|---|---|---|---|---|---|
| Copper | 29.75-30.00 | Mar. 3 | 29.50-30.00 | 29.750 | 29.750 | 30.510 |
| Lead | 13.55 | Apr. 1 | 13.30 | 12.610 | 14.060 | 13.300 |
| Zinc | 10.25 | Mar. 29 | 9.75 | 9.369 | 9.760 | 11.000 |
| Tin | 95.75 | Mar. 31 | 95.50 | 85.181 | 85.100 | 121.500 |
| Nickel | 60.00 | Jan. 14 | 56.50 | 60.000 | 60.000 | 60.000 |
| Aluminum | 21.50 | July 15 | 20.50 | 21.500 | 21.500 | 20.500 |
| Magnesium | 27.00 | Mar. 9 | 24.50 | 27.000 | 27.000 | 24.500 |

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

**Osmium:** $140-$150 per troy oz nom.

**Palladium:** $21 per troy oz.

**Platinum:** $84-$87 per troy oz from refineries.

**Radium:** $16-$21.50 per mg radium content, depending on quantity.

**Rhodium:** $125 per troy oz.

**Ruthenium:** $70-$75 per troy oz.

**Selenium:** 99.5%, $5-$6 per lb.

**Sodium:** 16.50, carlots; 17.00 l.c.l.

**Tantalum:** Sheet, rod $39.00 per lb; powder $33.50 per lb.

**Tellurium:** $1.75 per lb.

**Thallium:** $12.50 per lb.

**Tin:** Straits, New York, spot, 95.75; prompt, 95.75, as of Mar. 31.

**Titanium:** Sponge, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

**Tungsten:** Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb f.o.b. shipping point; less than 1000 lb $5.10; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

**Zinc:** Prime Western 10.25, brass special 10.50, intermediate 10.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.60, special high grade 11.75, die casting alloy ingot 14.25, del.

**Zirconium:** Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.
(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

**Aluminum Ingot:** Piston Alloys 20.50-22.00; No. 12 foundry alloy (No. 2 grade) 19.50-20.50, 5% silicon alloy, 0.60 Cu max., 22.50-23.00; 13 alloy, 0.60 Cu max., 22.50-23.00; 195 alloy 21.50-22.50; 108 alloy 20.00-21.50 steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.75-21.75; grade 2, 19.50-20.25; grade 3, 18.50-19.25; grade 4, 18.00-19.00.

**Brass Ingot:** Red brass, No. 115, 25.00; tin bronze No. 225, 36.75, No. 245, 31.00; high-leaded tin bronze, No. 305, 29.75; No. 1 yellow, No. 405, 21.15; manganese bronze No. 421, 26.25.

**Magnesium Alloy Ingot:** AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

## NONFERROUS MILL PRODUCTS

### COPPER WIRE

**Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98, Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l., 42.58.**

### LEAD

**(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or** more $18.50 per cwt; pipe, full coils $18.50 **per cwt; traps and bends, list prices plus 30%.**

### TITANIUM

**(Prices per lb, 100,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.**

### ZINC

**Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.26.**

### ZIRCONIUM

**Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.045 in., 1 cent per linear foot.**

| | NICKEL, "A" Nickel | MONEL, Monel | INCONEL, Inconel |
|---|---|---|---|
| Sheet, C.R. ... | 86.5 | 87.5 | 92.5 |
| Strip, C.R. ... | 92.5 | 70.5 | 98.5 |
| Plate, H.R. .. | 84.5 | 66.5 | 90.5 |
| Rod, Shapes .. | 82.5 | 65.5 | 88.5 |
| Seamless Tubes | 115.5 | 100.5 | 137.5 |
| Shot, Blocks .. .... | | 60.0 | .... |

### ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

| Thickness Range, Inches | Widths or Diameters, In., Inc. | Flat Sheet* | Coiled Sheet | Coiled Sheet Circle† |
|---|---|---|---|---|
| 0.249-0.136 | 12-49 | 33.9 | ... | ... |
| 0.135-0.096 | 12-48 | 34.4 | ... | ... |
| 0.095-0.077 | 12-48 | 35.1 | 32.7 | 37.5 |
| 0.076-0.061 | 12-48 | 35.7 | 32.9 | 37.7 |
| 0.060-0.048 | 12-48 | 36.1 | 33.3 | 38.1 |
| 0.047-0.038 | 12-48 | 36.6 | 33.6 | 38.4 |
| 0.037-0.030 | 12-48 | 37.0 | 34.0 | 39.1 |
| 0.029-0.024 | 12-48 | 37.6 | 34.3 | 39.6 |
| 0.023-0.019 | 12-36 | 38.3 | 35.1 | 40.4 |
| 0.018-0.017 | 12-36 | 39.1 | 35.7 | 41.3 |
| 0.016-0.015 | 12-36 | 40.0 | 36.5 | 42.5 |
| 0.014 | 12-24 | 41.0 | 37.5 | 43.8 |
| 0.013-0.012 | 12-24 | 42.1 | 38.2 | 44.8 |
| 0.011 | 12-24 | 43.1 | 39.4 | 46.4 |
| 0.010-0.0095 | 12-24 | 44.3 | 40.5 | 48.0 |
| 0.009-0.0085 | 12-24 | 45.6 | 41.9 | 50.0 |
| 0.008-0.0075 | 12-24 | 47.1 | 43.1 | 51.8 |
| 0.007 | 12-18 | 48.6 | 44.6 | 54.1 |
| 0.006 | 12-18 | 50.2 | 46.0 | 59.1 |

* 72-180 in. lengths. † 26 in. max. dia.

### ALUMINUM

**Plates and Circles:** Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

| Alloy | Plate Base | Circle Base |
|---|---|---|
| 2S-F, 3S-F ..... | 32.4 | 36.3 |
| 50S-F ..... | 33.5 | 37.4 |
| 4S-F ..... | 34.5 | 39.1 |
| 52S-F ..... | 36.2 | 40.9 |
| 61S-T6 ..... | 37.4 | 41.5 |
| 24S-T4* ..... | 39.3 | 45.4 |
| 75S-T6* ..... | 47.1 | 53.7 |

* 24-48 in. widths or dia., 72-180 in. lengths

### ALUMINUM

**Screw Machine Stock:** 5000 lb and over.

| Dia. (in.) or across flats | —Round— 11S-T3 | 17S-T4 | —Hexagonal— 11S-T3 | 17S-T4 |
|---|---|---|---|---|
| **Drawn** | | | | |
| 0.125 | 59.6 | 57.9 | ... | ... |
| 0.156-0.172 | 50.6 | 48.9 | ... | ... |
| 0.188 | 50.6 | 48.9 | ... | 52.4 |
| 0.219-0.234 | 47.9 | 46.2 | ... | ... |
| 0.250-0.281 | 47.9 | 46.2 | ... | 50.5 |
| 0.313 | 47.9 | 46.2 | ... | 50.5 |
| **Cold-finished** | | | | |
| 0.375-0.531 | 46.6 | 44.9 | 50.2 | 53.4 |
| 0.563-0.656 | 46.6 | 44.9 | 53.4 | 50.2 |
| 0.750-1.000 | 45.5 | 43.8 | 48.9 | 47.3 |
| 1.063 | 45.5 | 43.8 | ... | 45.7 |
| 1.125-1.500 | 43.5 | 42.1 | 47.3 | 45.7 |
| **Rolled** | | | | |
| 1.563 | 42.7 | 41.0 | ... | ... |
| 1.625-2.000 | 42.1 | 40.4 | ... | 44.1 |
| 2.125-2.500 | 41.1 | 39.4 | ... | ... |
| 2.750-3.375 | 39.9 | 38.2 | ... | ... |

### ALUMINUM

**Forging Stock:** Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.
**Pipe:** A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

| Nom. pipe size, in. | | Nom. pipe size, in. | |
|---|---|---|---|
| ⅜ | $15.05 | 2 | $ 46.30 |
| 1 | 23.65 | 4 | 127.70 |
| 1¼ | 32.00 | 6 | 228.50 |
| 1½ | 38.25 | 8 | 343.50 |

### MAGNESIUM

**Sheet:** AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.
**Plate:** Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.
**Extrusion Stock:** AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.60. Channels, 5 in. 67.80. I-Beams, 5 in. 86.20.

## BRASS MILL PRICES

| | MILL PRODUCTS a | | | | SCRAP ALLOWANCES f | | |
|---|---|---|---|---|---|---|---|
| | Sheet, Strip, Plate | Rod | Wire | Seamless Tube | Clean Heavy | Rod Ends | Clean Turnings |
| Copper ..... | 46.38b | 45.98c | .... | 48.44 | 26.000 | 26.000 | 25.250 |
| Yellow Brass ..... | 41.72 | 33.50d | 42.26 | 44.63 | 19.750 | 19.500 | 18.000 |
| Red Brass, 85% ..... | 45.44 | 45.38 | 45.98 | 48.25 | 23.000 | 22.750 | 22.250 |
| Low Brass, 80% ..... | 44.47 | 44.41 | 45.01 | 47.28 | 22.125 | 21.875 | 21.375 |
| Naval Brass ..... | 45.76 | 40.07 | 52.80 | 48.92 | 18.250 | 18.000 | 17.500 |
| Commercial Bronze, 90% .. | 46.95 | 46.89 | 47.49 | 49.51 | 23.875 | 23.625 | 23.125 |
| Nickel Silver, 10% .....e | 55.36 | 59.43g | 57.69 | .... | 23.625 | 23.375 | 11.813 |
| Phosphor Bronze, A, 5% .. | 66.58 | 67.08 | 67.08 | 68.23 | 26.125 | 25.875 | 24.875 |
| Silicon Bronze ..... | 52.71 | 51.90 | 52.75 | 70.11e | 25.125 | 24.875 | 24.125 |
| Manganese Bronze ..... | 49.48 | 43.62 | 54.06 | .... | 18.250 | 18.000 | 17.500 |
| Muntz Metal ..... | 43.96 | 39.77 | .... | .... | 18.625 | 18.375 | 17.875 |

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

## NONFERROUS SCRAP

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

**Aluminum:** 2S clippings 12.00; low copper clippings 12.00; mixed clippings 10.00-11.00; old sheet 9.50-10.00; borings and turnings 6.50; pistons and struts 6.50; crankcases 9.50-10.00; industrial castings 9.50-10.00.

**Copper and Brass:** Heavy copper and wire, No. 1 24.00; No. 2 copper 22.50; light copper 20.50; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 12.50; new brass clippings 11.00; No. 1 brass rod turnings 13.50; light brass 15.00; heavy yellow brass 13.50; new brass rod ends 15.00; auto radiators, unsweated, 13.50; cocks and faucets 15.00; brass pipe 16.25.

**Lead:** Heavy 10.00-10.50; battery plate 5.25-5.75; linotype and stereotype 12.50; electrotype 10.75; mixed babbitt 12.00.

**Magnesium:** Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

**Monel:** Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

**Nickel:** Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

**Tin:** No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

**Zinc:** Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

### REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

**Aluminum:** 2S, 3S clippings 14.50-15.00; 51S, 52S clippings 14.50-15.00; 14S, 17S, 24S clippings 13.00-14.00; mixed clippings 13.00-14.00; old sheet 11.50-12.00; old cast 11.50-12.00; clean old cable, free of steel 14.50-15.00; borings and turnings 12.00-12.50.

**Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not less than 1.6% Be, 42.00; light scrap 37.00.

**Copper, Brass:** No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; refinery brass (60% copper) per dry copper content 21.50-22.00; auto radiators, 15.50, nominal.

### INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

**Copper, Brass:** No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; No. 1 composition borings 19.00-19.50; No. 1 composition solids 19.50-20.00; heavy yellow brass solids 15.00-15.25; yellow brass turnings 14.00-14.25; radiators 15.50.

## PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

### ANODES

**Cadmium:** Special or patented shapes $1.75 per lb.

**Copper:** Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

**Nickel:** Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

**Tin:** Bar or slab, less than 200 lb $1.105; 200-499 lb $1.09; 500-999 lb $1.085; 1000 lb or more $1.08.

**Zinc:** Bar 18.50, bar or flat top 17.50, ton lots.

### CHEMICALS

**Cadmium Oxide:** $2.15 per lb, in 100 lb drums.
**Chromic Acid:** Less than 10,000 lb 28.50; over 10,000 lb 27.50.
**Copper Cyanide:** Under 1000 lb 63.90, 1000 lb and over 61.90.
**Copper Sulphate:** 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.
**Nickel Chloride:** 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 5,000-35,900 lb.
**Nickel Sulphate:** 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.
**Silver Cyanide:** Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.
**Sodium Cyanide:** Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.
**Sodium Stannate:** Less than 100 lb 70.6; 100-500 lb 56.3; 500-1900 lb 53.9; 2000-9900 lb 52.1; 10,000 lb or more 51.0.
**Stannous Chloride (Anhydrous):** Less than 50 lb $1.564; 50 lb $1.224; 100-300 lb $1.074; 400-900 lb $1.049; 100 -1900 lb $1.025; 2000-4900 lb 98.8; 5000-19,000 lb 92.7; 20,000 lb and over 86.6
**Stannous Sulphate:** Less than 50 lb $1.264; 50 lb 96.4; 100-1900 lb 94.4; 2000 lb and over 92.4.
**Zinc Cyanide:** Under 1000 lb 54.30, 1000 lb and over 52.30.

# Nonferrous Metals

**Lead and zinc are responding upward to natural rebound and artificial stimulation. Other metals are sharing in the buoyancy, too**

THE COMBINATION of natural rebound and artificial stimulation is proving a wondrous prescription for the particular ailments of lead and zinc. It isn't hurting the condition of other metals either.

In the stock market, many metal mining issues set new highs; copper, lead and zinc shares were especially active. On commodity exchanges here and abroad, futures spurted sharply. Prices firmed or increased across the board.

**Prognostications**—Confidently but privately predicting an 11-cent zinc and 14-cent lead this month, sellers last week hiked zinc a half cent, lead a quarter-cent. At 10.25 cents, E. St. Louis, for Prime Western grade, zinc is at its highest point since last September. Lead has matched its 1954 high by moving to 13.30 cents, St. Louis basis.

Buyers, after the initial frenzy that usually accompanies a rising price, settled down to more orderly April buying. They don't share the seller's optimism and generally believe the price climb has hit its stalling point for the present.

**The Big Move**—Copper has been nudged in several directions in the last ten days. Announcement that the government would buy 100,000 tons of Chilean copper for stockpile is considered the big step in removing the jam-up of red metal in South America. The purchase, at 30 cents a pound, will cost the U. S. $60 million; the Chilean government, which takes about 17 cents a pound profit on the metal, will benefit by about $27 million.

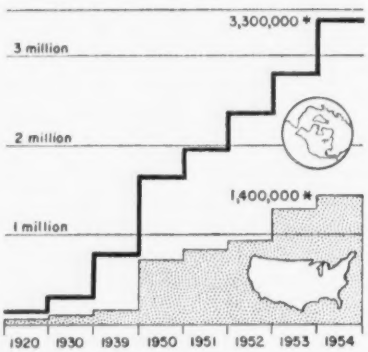
Still left in Chile are about 80,000 tons of unsold copper plus current output of about 30,000 tons monthly. The four-day strike in Northern Rhodesia and the East Coast dock troubles, which keep foreign copper from being unloaded, contribute to the short-term copper supply pinch. U. S. custom smelters are booked through April, but most buyers are refraining from May ordering with the present uncertainty.

## Import Policy in Spotlight

Administration policy on metals imports swung into sharp focus last week with President Eisenhower's plea for a liberal trade policy and announcement of stepped-up stockpile buying. Domestic sources for metals, the President stated, should be supported by direct means rather than by quotas or higher tariffs.

The "direct means" was the announcement of increased stockpiling of some 35-40 metals and minerals (out of 75 on the existing list), and upgrading of stocks already on hand. It's frankly admitted the purchases are designed to help "activate productive capacity and alleviate distressed conditions in domestic mineral industries."

**ALUMINUM PRODUCTION**
**U.S. Versus the World**
(Tons of 2000 pounds)




*Estimated by STEEL

In his recommendations to Congress, President Eisenhower called for a three-year extension of the Reciprocal Trade Agreements Act, modification of present provision of the "Buy American Act," authority to adjust certain tariff rates downward by 5 per cent annually and as much as 50 per cent for items imported in negligible quantities, further simplification of customs procedures and measures to increase private foreign investment. Under the proposal, ad valorem taxes would be a maximum of 50 per cent. Escape clause and peril point procedures would be maintained, and hearings on all tariff reductions would be provided for.

Philosophy of the administration in the move is that it's the way to close the dollar gap of imbalance in international payments. By our taking the initiative in lowering barriers gradually, but with full regard for our own interests, we would make clear to the rest of the world that we expect them to follow our lead.

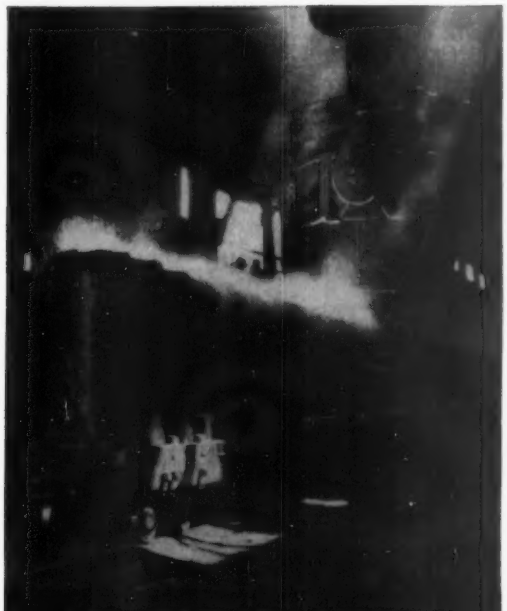
## Bill Limits Lead Imports

A bill to limit lead imports to 335,000 tons yearly and zinc to 325,000 tons yearly was introduced in the Senate by Idaho's Republician Senator Dworshak. Lead imports in 1953 amounted to 556,000 tons, zinc to 753,000 tons. The senator believes his bill the only long-term solution for stabilizing domestic mining industry and regards the new stockpiling program as "only an interim step."

## Market Memos

- Most ingot makers boosted prices of brass and bronze ingot last week. Red brasses went up 1.5 cent, tin bronzes up 2.5 cents, high-leaded tin bronze up 2.0 cents, yellow brasses up 1.5 cent and manganese bronzes up 2.0 cents.
- Extrusion and processing of aluminum tube and shapes is now under way at the Decatur, Ala., plant of Wolverine Tube Division, Calumet & Hecla Inc., changing the company's status from a secondary mill to a primary mill producer of aluminum tube.
- Zinc men are fretting about the continuing nickel shortage. Zinc die castings must be bright plated, and they figure their opportunity to regain ground lost to aluminum because of attractive prices is being lost.
- Kennecott Copper Corp., world's largest copper producer, turned out 9.5 per cent less red metal last year, but its silver output was up 6 per cent, gold up 13 per cent and molybdenite up 2 per cent.
- Sharp competition between exporters and secondary aluminum ingot smelters forced the latter to advance prices up to a half-cent last week.
- Magnesium mill product shipments in February were up 9 per cent from January but 27 per cent below February, 1953.
- Capacity operations in 1954 are foreseen by International Nickel Co. of Canada Ltd., which reported 1953 earnings of $53.7 million, third largest in the company's history.

# THIS COULD BE YOUR NEXT MONTH'S ORDER OF



Tangible benefits exist for you in the continuing improvement of facilities at Newport Steel. Your orders move along faster, from electric furnace to loading dock. Greater flexibility in production schedules ensures delivery of famed Newport quality just when you want it. And this helps relieve you of maintaining large and expensive inventories. Let us call and discuss other advantages of buying from Newport Steel, situated in the heart of the nation's greatest industrial growth.

ECONOMICAL WATERAIL DELIVERY

Newport Steel
CORPORATION
NEWPORT, KENTUCKY

# STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 167. Key to footnotes, page 169.

## SEMIFINISHED

**INGOTS, Carbon Forging (NT)**
Fontana,Calif. K1 $86.00
Munhall,Pa. U5 59.00

**INGOTS, Alloy (NT)**
Detroit R7 $63.00
Fontana,Calif. K1 88.00
Midland,Pa. C18 62.00
Munhall,Pa. U5 62.00

**BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)**
Aliquippa,Pa. J5 $62.00
Bessemer,Pa. U5 62.00
Clairton,Pa. U5 62.00
Ensley,Ala. T2 62.00
Fairfield,Ala. T2 62.00
Fontana,Calif. K1 70.00
Gary,Ind. U5 62.00
Johnstown,Pa. B2 62.00
Lackawanna,N.Y. B2 62.00
Munhall,Pa. U5 62.00
So.Chicago,Ill. U5 62.00
So.Duquesne,Pa. U5 62.00

**Carbon, Forging (NT)**
Aliquippa,Pa. J5 $75.50
Bessemer,Pa. U5 75.50
Buffalo R2 75.50
Clairton,Pa. U5 75.50
Cleveland R2 75.50
Conshohocken,Pa. A3 82.50
Detroit R7 78.50
Ensley,Ala. T2 75.50
Fairfield,Ala. T2 75.50
Fontana,Calif. K1 83.50
Gary,Ind. U5 75.50
Geneva,Utah C11 75.50
Houston S5 83.50
Johnstown,Pa. B2 75.50
Lackawanna,N.Y. B2 75.50
LosAngeles B3 85.00
Munhall,Pa. U5 75.50
Seattle B3 89.00
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 75.50
So.SanFrancisco B3 85.00

**Alloy, Forging (NT)**
Bethlehem,Pa. B2 $82.00
Buffalo R2 82.00
Canton,O. R2, T7 82.00
Conshohocken,Pa. A3 89.00
Detroit R7 84.00
Fontana,Calif. K1 101.00
Gary,Ind. U5 82.00
Houston S5 90.00
Ind.Harbor,Ind. Y1 82.00
Johnstown,Pa. B2 82.00
Lackawanna,N.Y. B2 82.00
LosAngeles B3 102.00
Massillon,O. R2 82.00
Midland,Pa. C18 82.00
Munhall,Pa. U5 82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 82.00
Struthers,O. Y1 82.00
Warren,O. C17 82.00

**ROUNDS, SEAMLESS TUBE (NT)**
Buffalo R2 $92.50
Canton,O. R2 92.50
Cleveland R2 92.50
Fontana,Calif. K1 113.50
Gary,Ind. U5 92.50
Massillon,O. R2 92.50
So.Chicago,Ill. R2 92.50
So.Duquesne,Pa. U5 92.50

**SHEET BAR (NT)**
Fontana,Calif. K1 $93.18

**SKELP**
Aliquippa,Pa. J5 3.85
Munhall,Pa. U5 3.75
Warren,O. R2 3.75
Youngstown R2, U5 3.75

**WIRE RODS**
AlabamaCity,Ala. R2 4.525
Aliquippa,Pa. J5 4.525
Alton,Ill. L1 4.70
Buffalo W12 4.525
Cleveland A7 4.525
Donora,Pa. A7 4.525
Fairfield,Ala. T2 4.525
Fontana,Calif. K1 5.325
Houston S5 4.925
Johnstown,Pa. B2 4.525
Joliet,Ill. A7 4.525
KansasCity,Mo. S5 4.865
LosAngeles B3 5.325
Minnequa,Colo. C10 4.775
Monessen,Pa. P7 4.525
No.Tonawanda,N.Y. B11 4.525
Pittsburg,Calif. C11 5.175
Portsmouth P12 4.525
Roebling,N.J. R5 4.625
So.Chicago,Ill. R2 4.525
SparrowsPoint,Md. B2 4.625
Sterling,Ill.(1) N15 4.525
Struthers,O. Y1 4.525
Torrance,Calif. C11 5.325
Worcester,Mass. A7 4.825

## STRUCTURALS

**Carbon Steel Stand. Shapes**
Alabama City,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Bessemer,Ala. T2 4.10
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fairfield,Ala. T2 4.10
Fontana,Calif. K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
Houston S5 4.50
Ind.Harbor,Ind. I-2 4.10
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.70
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.80
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Niles,Calif. P1 4.80
Phoenixville,Pa. P4 4.15
Seattle B3 4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 4.75
Torrance,Calif. C11 4.80
Weirton,W.Va. W6 4.10

**Wide Flange**
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fontana,Calif. K1 5.10
Lackawanna,N.Y. B2 4.15
Munhall,Pa. U5 4.10
Phoenixville,Pa. P4 4.95
So.Chicago,Ill. U5 4.10

**Alloy Stand. Shapes**
Clairton,Pa. U5 5.00
Fontana,Calif. K1 6.40
Gary,Ind. U5 5.00
Munhall,Pa. U5 5.00
So.Chicago,Ill. U5 5.00

**H.S., L.A. Stand. Shapes**
Aliquippa,Pa. J5 6.175
Bessemer,Ala. T2 6.175
Bethlehem,Pa. B2 6.20
Clairton,Pa. U5 6.175
Fairfield,Ala. T2 6.175
Fontana,Calif. K1 6.825
Gary,Ind. U5 6.175
Geneva,Utah C11 6.175
Ind.Harbor,Ind. I-2 6.175
Ind.Harbor,Ind. Y1 6.675
Johnstown,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
LosAngeles B3 6.85
Munhall,Pa. U5 6.175
Seattle B3 6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 6.80
Struthers,O. Y1 6.675

**H.S., L.A. Wide Flange**
Bethlehem,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
Munhall,Pa. U5 6.125
So.Chicago,Ill. U5 6.125

## PILING

**BEARING PILES**
Munhall,Pa. U5 4.10
So.Chicago,Ill. U5 4.10

**STEEL SHEET PILING**
Ind.Harbor,Ind. I-2 4.925
Lackawanna,N.Y. B2 4.925
Munhall,Pa. U5 4.925
So.Chicago,Ill. U5 4.925

## PLATES

**PLATES, Carbon Steel**
AlabamaCity,Ala., R2 4.10
Aliquippa,Pa. J5 4.10
Ashland,Ky. (15) A10 4.10
Bessemer,Ala. T2 4.10
Clairton,Pa. U5 4.10
Claymont,Del. C22 4.10
Cleveland J5, R2 4.10
Coatesville,Pa. L7 4.10
Conshohocken,Pa. A3 4.10
Ecorse,Mich. G5 4.30
Fairfield,Ala. T2 4.10
Fontana,Calif.(30) K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
GraniteCity,Ill. G4 4.30
Harrisburg,Pa. C5 4.10
Houston S5 4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 4.10
Lackawanna,N.Y. B2 4.10
*LoneStar,Tex. L6 4.40*
Minnequa,Colo. C10 4.95
Munhall,Pa. U5 4.10
Pittsburgh J5 4.10
Riverdale,Ill. A1 4.10
Seattle B3 5.00
Sharon,Pa. S3 4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 4.10
Steubenville,O. W10 4.10
Warren,O. R2 4.10
Weirton,W.Va. W6 4.10
Youngstown R2, U5, Y1 4.10

**PLATES, Carbon Abras. Resist.**
Fontana,Calif. K1 5.90
Geneva,Utah C11 5.25

**PLATES, Wrought Iron**
Economy,Pa. B14 9.30

**PLATES, High-Strength Low-Alloy**
Aliquippa,Pa. J5 6.25
Bessemer,Ala. T2 6.25
Clairton,Pa. U5 6.25
Cleveland J5 6.25
Conshohocken,Pa. A3 6.25
Ecorse,Mich. G5 6.45
Fairfield,Ala. T2 6.25
Fontana,Calif.(30) K1 6.95
Gary,Ind. U5 6.25
Geneva,Utah C11 6.25
Ind.Harbor,Ind. I-2 6.25
Ind.Harbor,Ind. Y1 6.75
Johnstown,Pa. B2 6.25
Lackawanna,N.Y. B2 6.25
Munhall,Pa. U5 6.25
Pittsburgh J5 6.25
Seattle B3 7.15
Sharon,Pa. S3 6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 6.25
Youngstown U5 6.25
Youngstown Y1 6.75

**PLATES, Alloy**
Claymont,Del. C22 5.55
Coatesville,Pa. L7 5.55
Fontana,Calif. K1 6.60
Gary,Ind. U5 5.55
Johnstown,Pa. B2 5.55
Munhall,Pa. U5 5.55
Sharon,Pa. S3 5.55
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 5.55

**FLOOR PLATES**
Cleveland J5 5.15
Conshohocken,Pa. A3 5.15
Harrisburg,Pa. C5 5.15
Ind.Harbor,Ind. I-2 5.15
Munhall,Pa. U5 5.15
So.Chicago,Ill. U5 5.15

**PLATES, Ingot Iron**
Ashland c.l. (15) A10 4.35
Ashland,l.c.l.(15) A10 4.85
Cleveland, c.l. R2 4.70
Warren,O. c.l. R2 4.70

## BARS

**BARS, Hot-Rolled Carbon**
Aliquippa,Pa. J5 4.15
Alton,Ill. L1 4.35
*Atlanta,Ga. A11 4.35*
Bessemer,Ala. T2 4.15
Birmingham,Ala. C15 4.15
Buffalo(31) R2 4.18
Clairton,Pa. U5 4.15
Cleveland(31) R2 4.21
Detroit R7 4.30
Ecorse,Mich. G5 4.35
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Gadsden,Ala.(31) R2 4.18
Houston S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.60
Niles,Calif. P1 4.85
N.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
Portland,Oreg. O4 4.90
Seattle B3, N14 4.90
So.Chicago U5, W14 4.15
Chicago(31) R2 4.22
So.Duquesne,Pa. U5 4.15
So.SanFran.,Calif. B3 4.90
Sterling,Ill. (1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Weirton,W.Va. W6 4.15
Youngstown U5 4.15
Youngstown(31) R2 4.20

**BARS, Hot-Rolled Alloy**
Bethlehem,Pa. B2 4.875
Buffalo R2 4.875
Canton,O. R2, T7 4.875
Clairton,Pa. U5 4.875
Detroit R7 4.975
Ecorse,Mich. G5 5.075
Fairless,Pa. U5 5.025
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.875
Houston S5 5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 4.875
KansasCity,Mo. S5 5.475
Lackawanna,N.Y. B2 4.875
LosAngeles B3 5.925
Massillon,O. R2 4.875
Midland,Pa. C18 4.875
So.Chicago R2,U5,W14 4.875
So.Duquesne,Pa. U5 4.875
Struthers,O. Y1 4.875
Warren,O. C17 4.875
Youngstown U5 4.875

**BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy**
Aliquippa,Pa. J5 6.225
Bessemer,Ala. T2 6.225
Bethlehem,Pa. B2 6.225
Clairton,Pa. U5 6.225
Ecorse,Mich. G5 6.425
Fairfield,Ala. T2 6.225
Fontana,Calif. K1 7.475
Gary,Ind. U5 6.225
Ind.Harb.,Ind. Y1 6.725
Ind.Harb.,Ind. I-2 6.225
Johnstown,Pa. B2 6.225
Lackawanna,N.Y. B2 6.225
LosAngeles B3 6.925
Pittsburgh J5 6.225
Seattle B3 6.975
So.Chicago W14 6.225
So.Duquesne,Pa. U5 6.225
So.SanFrancisco B3 6.975
Struthers,O. Y1 6.725
Youngstown U5 6.225

**BAR SIZE ANGLES; H.R.CARBON**
Bethlehem,Pa. B2 4.35

**BAR SIZE ANGLES; S. Shapes**
Aliquippa,Pa. J5 4.15
Atlanta A11 4.35
Niles,Calif. P1 4.85
SanFrancisco S7 5.10

**BAR SHAPES, Hot-Rolled Alloy**
Clairton,Pa. U5 5.00
Fontana,Calif. K1 5.925
Gary,Ind. U5 5.00
Houston S5 5.60
KansasCity S5 5.60
Youngstown U5 5.00

**BARS, Cold-Finished Carbon**
Ambridge,Pa. W18 5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 5.25
Camden,N.J. P13 5.65
Carnegie,Pa. C12 5.20
Chicago W18 5.20
Cleveland A7, C20 5.20
Detroit P17, R7 5.35
Detroit B5 5.40
Donora,Pa. A7 5.20
Elyria,O. W8 5.20
FranklinPark,Ill. N5 5.20
Gary,Ind. R2 5.20
GreenBay,Wis. F7 5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 5.75
Harvey,Ill. B5 5.20
LosAngeles R2, S30 6.65
Mansfield,Mass. B5 5.75
Massillon,O. R2, R8 5.20
Monaca,Pa. S17 5.20
Newark,N.J. W18 5.65
NewCastle,Pa.(17) B4 5.20
Pittsburgh J5 5.20
Plymouth,Mich. P5 5.45
Putnam,Conn. W18 5.75
Readville,Mass. C14 5.75
St.Louis,Mo. M5 5.50
So.Chicago,Ill. W14 5.20
SpringCity,Pa. K3 5.65
Struthers,O. Y1 5.20
Waukegan,Ill. A7 5.20
Worcester,Mass. W19 6.10
Youngstown F3, Y1 5.20

**BARS, Cold-Finished Alloy (Turned and Ground)**
Cumberland,Md.(5) C19 4.45

**BARS, Cold-Finished Alloy**
Ambridge,Pa. W18 6.325
BeaverFalls,Pa. M12 6.325
Bethlehem,Pa. B2 6.325
Buffalo B5 6.325
Camden,N.J. P13 6.50
Canton,O. R2, T7 6.325
Carnegie,Pa. C12 6.325
Chicago W18 6.325
Cleveland A7, C20 6.325
Detroit R7 6.425
Detroit P17 6.475
Detroit B5 6.525
Donora,Pa. A7 6.325
Elyria,O. W8 6.325
Gary,Ind. R2 6.325
Hammond,Ind. L2,M13 6.325
Hartford,Conn. R2 6.775
Harvey,Ill. B5 6.325
Lackawanna,N.Y. B2 6.325
Mansfield,Mass. B5 6.775
Massillon,O. R2, R8 6.325
Midland,Pa. C18 6.325
Monaca,Pa. S17 6.325
Newark,N.J. W18 6.85
Plymouth,Mich. P5 6.525
So.Chicago,Ill. R2,W14 6.325
SpringCity,Pa. K3 6.50
Struthers,O. Y1 6.325
Warren,O. C17 6.325
Waukegan,Ill. A7 6.325
Worcester,Mass. A7 6.625
Youngstown F3, Y1 6.325

**BARS, Reinforcing (Fabricators)**
AlabamaCity,Ala. R2 4.15
Atlanta A11 4.35
Birmingham,Ala. C15 4.15
Buffalo R2 4.15
Cleveland R2 4.15
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.85
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
SandSprings,Okla. S5 5.00
Seattle B3, N14 4.90
So.Chicago,Ill. R2 4.15
So.Duquesne,Pa. U5 4.15
So.SanFrancisco B3 4.90
SparrowsPoint,Md. B2 4.15
Sterling,Ill.(1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Youngstown R2, U5 4.15

**BARS, Reinforcing (Fabricated; to consumers)**
Johnstown, ¼-1" B2 5.55
KansasCity S5 6.35
LosAngeles B3 5.80
Marion,O. P11 5.55
Seattle N14 5.80
Seattle B3 5.85
So.SanFrancisco B3 5.85
SparrowsPt., ¼-1" B2 5.55
Williamsport,Pa. S19 5.45

**RAIL STEEL BARS**
Avis,Pa.(3) J8 4.25
ChicagoHts.(3) C2, I-2 4.05
ChicagoHts.(4) C2, I-2 4.15
Ft.Worth,Tex.(26) T4 4.65
Franklin,Pa.(3) F5 4.05
Franklin,Pa.(4) F5 4.15
Marion,O.(3) P11 4.00
Moline,Ill.(3) R2 4.15
Tonawanda(3,4) B12 4.15
Williamsport,Pa.(3) S19 4.25
Williamsport,Pa.(4) S19 5.45

**BARS, Wrought Iron**
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 10.40
McK.Rks.(D.R.) L5 14.00
McK.Rks(Staybolt) L5 15.50

## SHEETS

**SHEETS, Hot-Rolled Steel (18 gage and heavier)**
AlabamaCity,Ala. R2 3.925
Allenport,Pa. P7 3.925
Ashland,Ky.(8) A10 3.925
Cleveland J5, R2 3.925
Conshohocken,Pa. A3 4.05
Detroit M1 4.125
Ecorse,Mich. G5 4.125
Fairfield,Ala. T2 3.925
Fairless,Pa. U5 4.025
Fontana,Calif. K1 4.70
Gary,Ind. U5 3.925
Geneva,Utah C11 4.025
GraniteCity,Ill. G4 4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 3.925

Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2..3.925
Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

**SHEETS H.R. (19 gage)**
AlabamaCity,Ala. R2 ..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

**SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy**
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint(36) B2 ...5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

**SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)**
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O R2 .....4.525

**SHEETS, Cold-Rolled Steel (Commercial Quality)**
Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind I-2,Y1.4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

**SHEETS, Cold-Rolled High-Strength Low Alloy**
Cleveland J5, R2 .....7.225
Ecorse,Mich G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint(38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

**SHEETS, Cold-Rolled Ingot Iron**
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

| **SHEETS, Culvert** | **Cu Alloy** | **Cu Fe** |
|---|---|---|
| Ashland,Ky. A10 | 6.325 | |
| Canton,O. R2 | 6.475 | 6.925 |
| Fairfield, T2 | 6.075 | 6.325 |
| Gary,Ind. U5 | 6.075 | 6.325 |
| Ind.Harbor I-2 | 6.075 | 6.325 |
| Irvin,Pa. U5 | 6.075 | 6.325 |
| Kokomo,Ind. C16 | 6.175 | |
| MartinsFry.,O. W10 | 6.075 | |
| Pitts.,Calif. C11 | 6.825 | |
| SparrowsPt. B2 | 6.075 | |
| Torrance,Cal. C11 | 7.075 | |

| **SHEETS, Culvert** | **Pure Iron** |
|---|---|
| Ashland,Ky. A10 | 6.575 |
| Fairfield,Ala. T2 | 6.325 |
| MartinsFerry,O. W10 | 6.325 |

**SHEETS, Gal'd No. 10 Steel**
AlabamaCity,Ala. R2 ...5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O R2 .....5.275
Delphos,O N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ...5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2...5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ...6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc

**SHEETS, Galvanized No. 10 High-Strength Low-Alloy**
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2...8.075

**SHEETS, Galvanized Ingot Iron No. 10 flat**
Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

**SHEETS, Galvannealed Steel**
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

**SHEETS, ZINCGRIP Steel**
Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

**SHEETS, ZINCGRIP Ingot Iron**
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

**SHEETS, Electrogalvanized**
Cleveland R2 (28) ....6.125
Niles,O. R2 (28) .....6.125
Weirton,W.Va. W6 ....5.975

**SHEETS, ALUMINIZED**
Butler,Pa. A10 .....8.625

**SHEETS, Enameling Iron**
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

**BLUED STOCK, 29 ga.**
Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

**SHEETS, Long Terne Steel (Commercial Quality)**
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

**SHEETS, Long Terne, Ingot Iron**
Middletown,O. A10 ....6.075

**SHEETS, Well Casing**
Fontana,Calif. K1 .....6.20

## STRIP

**STRIP, Hot-Rolled Carbon**
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 .....3.925
Birmingham C15 .....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.125
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 ..3.925
KansasCity,Mo.(9) S5 ..4.525
Lackw'na,N.Y.(25) B2 3.925
LosAngeles(25) B3 .....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ....5.025
NewBritain(10) S15 .....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
San Francisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 .3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

**STRIP, Hot-Rolled Alloy**
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 .....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

**STRIP, Hot-Rolled High-Strength Low-Alloy**
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

**STRIP, Hot-Rolled Ingot Iron**
Ashland,Ky.(8) A10 ...4.175
Warren,O. R2 .....4.525

**STRIP, Cold-Rolled Carbon**
Anderson,Ind G5 .....5.45
Bridgeprt,Conn.(10) S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich D3 ....5.65
Detroit D2, M1, P20 ...5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinaPrk.,Ill. T6 ..5.70
Ind.Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass T6 .....6.10
Middletown,O. A10 .....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 .....5.75
NewCastle,Pa. B4, E5...5.45
NewHaven,Conn. A7 .....6.20
NewHaven,Conn. D2 ....5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(32) R6 .....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

**STRIP, Cold-Rolled Alloy Steel**
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O G6 .....12.00
Fontana,Calif. K1 .....13.65
Harrison,N.J. C18 .....12.00
Pawtucket,R.I.(41) NS.12.15
Pawtucket,R.I.(42) NS.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ....12.30
Youngstown C8 .....12.00

**STRIP, Cold-Rolled High-Strength Low-Alloy**
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich D3 .....7.90
Dover,O G6 .....8.00
Ecorse,Mich G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 .....8.15
Youngstown Y1 .....8.30

**STRIP, Cold-Rolled Ingot Iron**
Warren,O. R2 .....6.05

**STRIP, Electrogalvanized**
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 .....5.45
Youngstown C8 .....5.70

**TIGHT COOPERAGE HOOP**
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

## Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shafts
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O2 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Steel&Tube

| STRIP, Cold-Finished | 0.26-0.40C | 0.41-0.60C | 0.61-0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|---|---|
| Spring Steel (Annealed) | | | | | |
| Bridgeport,Conn.(10) S15 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| Bristol,Conn. W1 | ... | ... | 8.90 | 10.85 | ... |
| Carnegie,Pa. S18 | ... | 7.65 | 8.60 | 10.55 | 12.85 |
| Cleveland A7 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| Cleveland,O. C7 | ... | 8.00 | 8.60 | 10.55 | 12.85 |
| Dearborn,Mich. D3 | 5.65 | 7.85 | 8.80 | ... | ... |
| Detroit D2 | 5.65 | 7.85 | 8.80 | 10.55 | ... |
| Dover,O. G6 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| FranklinPark,Ill. T6 | 5.70 | 7.80 | 8.75 | 10.70 | 13.00 |
| Harrison,N.J. C18 | ... | ... | 8.90 | 10.85 | 13.15 |
| Indianapolis C8 | ... | 7.80 | 8.60 | 10.55 | ... |
| Mattapan,Mass. T6 | 6.10 | 7.95 | 8.90 | 10.85 | 13.15 |
| NewBrit'n,Conn.(10) S15 | 5.75 | 7.65 | 8.60 | 10.55 | 12.85 |
| NewCastle,Pa. B4 | 5.45 | 7.65 | 8.60 | ... | ... |
| NewCastle,Pa. E5 | 5.45 | 8.00 | 8.60 | 10.55 | 12.85 |
| NewHaven,Conn. D2 | 5.90 | 7.95 | 8.90 | 10.85 | ... |
| NewYork W3 | ... | 7.95 | 8.90 | 10.85 | 13.15 |
| Pawtucket,R.I.(11) N8 | ... | 7.65 | 8.60 | 10.55 | 12.85 |
| Pawtucket,R.I.(12) N8 | 6.10 | 7.95 | 8.90 | 10.85 | 13.15 |
| Sharon,Pa. S3 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| Trenton,N.J. R5 | ... | 7.95 | 8.90 | 10.85 | 13.15 |
| Wallingford,Conn. W2 | 5.90 | 7.95 | 8.90 | 10.85 | 13.15 |
| Warren,O. T5 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| Weirton,W.Va. W6 | 5.45 | 7.65 | 8.60 | 10.55 | 12.85 |
| Worcester,Mass. A7 | 6.30 | 7.95 | 8.90 | 10.85 | 13.15 |
| Worcester,Mass. T6 | 6.10 | 7.95 | 8.90 | 10.85 | 13.15 |
| Youngstown C8 | ... | 7.65 | 8.60 | 10.55 | 12.85 |
| **Spring Steel (Tempered)** | | | | | |
| Buffalo W12 | ... | ... | 12.50 | ... | ... |
| Bristol,Conn. W1 | ... | ... | 12.50 | 15.00 | ... |
| FranklinPark,Ill. T6 | ... | ... | 13.25 | 15.75 | 18.75 |
| Harrison,N.J. C18 | ... | ... | 12.50 | 15.00 | 18.00 |
| NewYork W3 | ... | ... | 12.50 | 15.00 | 18.00 |
| Trenton,N.J. R5 | ... | ... | 12.50 | 15.00 | 18.00 |
| Worcester,Mass. T6 | ... | ... | 12.50 | 15.00 | 18.00 |
| Worcester,Mass. W12 | ... | ... | 12.50 | ... | ... |
| Youngstown C8 | ... | ... | 12.50 | 15.00 | 18.00 |

## SILICON STEEL

| H.R. SHEETS (22 gage) (Cut Lengths) | Field | Arma-ture | Elec-tric | Motor | Dyna-mo |
|---|---|---|---|---|---|
| BeechBottom,W.Va. W10 | ... | ... | 8.75 | 9.75 | 10.65 |
| Brackenridge,Pa. A4 | ... | ... | 8.75 | 9.75 | 10.65 |
| IndianaHarbor,Ind. I-2 | 7.85 | 8.15 | 8.75 | 9.75 | ... |
| Mansfield,O. E6 | 7.85 | 8.15 | 8.75 | 9.75 | 10.65 |
| Newport,Ky. N9 | 7.85 | 8.15 | 8.75 | 9.75 | 10.65 |
| Niles,O. N12 | 7.85 | 8.15 | 8.75 | 9.75 | ... |
| Vandergrift,Pa. U5 | ... | 8.15 | 8.75 | 9.75 | 10.65 |
| Warren,O. R2 | 7.85 | 8.15 | 8.75 | 9.75 | ... |
| Zanesville, O. A10 | ... | 8.15 | 8.75 | 9.75 | 10.65 |

| C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower) | Field | Arma-ture | Elec-tric | Motor | Dyna-mo |
|---|---|---|---|---|---|
| GraniteCity,Ill. G4 | 8.25* | 8.60* | 9.20* | 10.20* | ... |
| IndianaHarbor,Ind. I-2 | 8.05 | 8.40* | 9.00* | ... | ... |
| Vandergrift,Pa. U5 | 8.05* | 8.90 | 9.50 | 10.50 | 11.40 |
| Warren,O. R2 | 8.05‡ | 8.90 | 9.50 | 10.50 | 11.40 |

| H.R. SHEETS (22 Gage) (Cut Lengths) | Transformer Grade T-72 | T-65 | T-58 | T-52 |
|---|---|---|---|---|
| BeechBottom,W.Va. W10 | 11.60 | 12.15 | 12.65 | 13.65 |
| Brackenridge,Pa. A4 | 11.60 | ... | ... | ... |
| Newport,Ky. N9 | 11.60 | ... | ... | ... |
| Vandergrift,Pa. U5 | 11.60 | 12.15 | 12.65 | 13.65 |
| Zanesville,O. A10 | 11.60 | 12.15 | 12.65 | 13.65 |

| C.R. COILS & CUT LENGTHS (22 Ga.) | T-100 | T-90 | T-80 | T-73 | T-72 |
|---|---|---|---|---|---|
| Butler,Pa. A10 | ... | ... | 16.25 | 16.75 | ... |
| Vandergrift,Pa. U5 | 13.65 | 14.65 | 16.25 | 16.75 | 12.35‡ |
| Warren,O. R2 | ... | ... | ... | ... | 12.35‡ |

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

## TIN MILL PRODUCTS

| TIN PLATE Electrolytic (Base Box) | 0.25 lb | 0.50 lb | 0.75 lb |
|---|---|---|---|
| Aliquippa,Pa. J5 | $7.40 | $7.65 | $8.05 |
| Fairfield,Ala. T2 | 7.50 | 7.75 | 8.15 |
| Fairless,Pa. U5 | 7.50 | 7.75 | 8.15 |
| Gary,Ind. U5 | 7.40 | 7.65 | 8.05 |
| GraniteCity,Ill. G4 | 7.60 | 7.85 | 8.25 |
| IndianaHarbor,Ind. I-2, Y1 | 7.40 | 7.65 | 8.05 |
| Irvin,Pa. U5 | 7.40 | 7.65 | 8.05 |
| Niles,O. R2 | 7.40 | 7.65 | 8.05 |
| Pittsburg,Calif. C11 | 8.15 | 8.40 | 8.80 |
| SparrowsPoint,Md. B2 | 7.50 | 7.75 | 8.15 |
| Weirton,W.Va. W6 | 7.40 | 7.65 | 8.05 |
| Yorkville,O. W10 | 7.40 | 7.65 | 8.05 |

| TIN PLATE, American Coke (Base Box) | 1.25 lb | 1.50 lb |
|---|---|---|
| Aliquippa,Pa. J5 | $8.70 | $8.95 |
| Fairfield,Ala. T2 | 8.80 | 9.05 |
| Fairless,Pa. U5 | 8.80 | 9.05 |
| Gary,Ind. U5 | 8.70 | 8.95 |
| Ind.Har. I-2, Y1 | 8.70 | 8.95 |
| Irvin,Pa. U5 | 8.70 | 8.95 |
| Pitts.,Cal. C11 | 9.45 | 9.70 |
| Sp.Pt.,Md. B2 | 8.80 | 9.05 |
| Warren,O. R2 | 8.70 | 8.95 |
| Weirton,W.Va. W6 | 8.70 | 8.95 |
| Yorkville,O. W10 | 8.70 | 8.95 |

| BLACK PLATE (Base Box) | |
|---|---|
| Aliquippa,Pa. J5 | $6.50 |
| Fairfield,Ala. T2 | 6.60 |
| Fairless,Pa. U5 | 6.60 |
| Gary,Ind. U5 | 6.50 |
| GraniteCity,Ill. G4 | 6.70 |
| Ind.Harbor,Ind. I-2, Y1 | 6.50 |
| Irvin,Pa. U5 | 6.50 |
| Niles,O. R2 | 6.50 |
| Pittsburg,Calif. C11 | 7.25 |
| SparrowsPoint,Md. B2, | 6.60 |
| Warren,O. R2 | 6.50 |
| Weirton,W.Va. W6 | 6.50 |
| Yorkville,O. W10 | 6.50 |

| HOLLOWARE ENAMELING Black Plate (29 gage) | |
|---|---|
| Follansbee,W.Va. F3 | 6.10 |
| Gary,Ind. U5 | 6.10 |
| GraniteCity,Ill. G4 | 6.30 |
| Ind.Harbor,Ind. Y1 | 6.10 |
| Irvin,Pa. U5 | 6.10 |
| Yorkville,O. W10 | 6.10 |

| MANUFACTURING TERNES (Special Coated) | |
|---|---|
| Fairfield,Ala. T2 | $7.85 |
| Gary,Ind. U5 | 7.75 |
| Irvin,Pa. U5 | 7.75 |
| Yorkville,O. W10 | 7.75 |

| MANUFACTURING TERNES, 8 lb (Commercial Quality) | |
|---|---|
| Gary,Ind. U5 | $9.75 |
| Yorkville,O. W10 | 9.75 |

| MANUFACTURING TERNES, LT. Coated, 6 lb | |
|---|---|
| Yorkville,O. W10 | $8.65 |

| ROOFING SHORT TERNES (8 lb Coated) | |
|---|---|
| Gary,Ind. U5 | 9.75 |

## WIRE

| WIRE, Manufacturers Bright, Low Carbon | |
|---|---|
| AlabamaCity,Ala. R2 | 5.525 |
| Aliquippa,Pa. J5 | 5.525 |
| Alton,Ill. L1 | 5.70 |
| Atlanta A11 | 5.725 |
| Bartonville,Ill. K4 | 5.625 |
| Buffalo W12 | 5.525 |
| Chicago W13 | 5.525 |
| Cleveland A7, C20, R2 | 5.525 |
| Crawfordsville,Ind. M8 | 5.625 |
| Donora,Pa. A7 | 5.525 |
| Duluth,Minn. A7 | 5.525 |
| Fairfield,Ala. T2 | 5.525 |
| Fostoria,O. (24) S1 | 5.75 |
| Houston S5 | 5.925 |
| Jacksonville,Fla. M8 | 6.05 |
| Johnstown,Pa. B2 | 5.525 |
| Joliet,Ill. A7 | 5.525 |
| KansasCity,Mo. S5 | 6.125 |
| Kokomo,Ind. C16 | 5.625 |
| LosAngeles B3 | 6.475 |
| Minnequa,Colo. C10 | 5.775 |
| Monessen,Pa. P7 | 5.525 |
| No.Tonawanda B11 | 5.525 |
| Palmer,Mass. W12 | 5.825 |
| Pittsburg,Calif. C11 | 6.475 |
| Portsmouth,O. P12 | 5.525 |
| Rankin,Pa. A7 | 5.525 |
| So.Chicago,Ill. R2 | 5.525 |
| So.SanFrancisco C10 | 6.475 |
| SparrowsPoint,Md. B2 | 5.625 |
| Sterling,Ill.(1) N15 | 5.525 |
| Struthers,O. Y1 | 5.525 |
| Waukegan,Ill. A7 | 5.525 |
| Worcester,Mass. A7 | 5.825 |

| WIRE, MB Spring, High Carbon | |
|---|---|
| Aliquippa,Pa. J5 | 6.925 |
| Alton,Ill. L1 | 7.10 |
| Bartonville,Ill. K4 | 7.025 |
| Buffalo W12 | 6.925 |
| Cleveland A7 | 6.925 |
| Donora,Pa. A7 | 6.925 |
| Duluth,Minn. A7 | 6.925 |
| Fostoria,O. S1 | 6.925 |
| Johnstown,Pa. B2 | 6.925 |
| LosAngeles B3 | 7.875 |
| Millbury,Mass.(12) N6 | 7.225 |
| Minnequa,Colo. C10 | 7.175 |
| Monessen,Pa. P7, P16 | 6.925 |
| Muncie,Ind. I-7 | 7.125 |
| Palmer,Mass. W12 | 7.225 |
| Pittsburg,Calif. C11 | 7.875 |
| Portsmouth,O. P12 | 6.925 |
| Roebling,N.J. R5 | 7.225 |
| So.Chicago,Ill. R2 | 6.925 |
| So.SanFran. C10 | 7.875 |
| SparrowsPt.,Md. B2 | 7.025 |
| Struthers,O. Y1 | 6.925 |
| Trenton,N.J. A7 | 7.225 |
| Waukegan,Ill. A7 | 6.925 |
| Worcester A7, J4 | 7.225 |
| Worcester T6, W12 | 7.225 |

| WIRE, Upholstery Spring | |
|---|---|
| Aliquippa,Pa. J5 | 6.625 |
| Alton,Ill. L1 | 6.80 |
| Buffalo W12 | 6.625 |
| Cleveland A7 | 6.625 |
| Donora,Pa. A7 | 6.625 |
| Duluth,Minn. A7 | 6.625 |
| Johnstown,Pa. B2 | 6.625 |
| LosAngeles B3 | 7.575 |
| Minnequa,Colo. C10 | 6.80 |
| Monessen,Pa. P7, P16 | 6.625 |
| NewHaven,Conn. A7 | 6.925 |
| Palmer,Mass. W12 | 6.925 |
| Pittsburg,Calif. C11 | 7.575 |
| Portsmouth,O. P12 | 6.625 |
| Roebling,N.J. R5 | 6.925 |
| So.Chicago,Ill. R2 | 6.625 |
| So.SanFrancisco C10 | 7.575 |
| SparrowsPoint,Md. B2 | 6.725 |
| Trenton,N.J. A7 | 6.925 |
| Waukegan,Ill. A7 | 6.625 |
| Worcester,Mass. A7 | 6.925 |

| WIRE, Fine & Weaving(8" Coils) | |
|---|---|
| Alton,Ill. L1 | 10.75 |
| Bartonville,Ill. K4 | 10.65 |
| Buffalo W12 | 10.55 |
| Chicago W13 | 10.55 |
| Cleveland A7 | 10.55 |
| Crawfordsville,Ind. M8 | 10.65 |
| Fostoria,O. S1 | 10.55 |
| Jacksonville,Fla. M8 | 11.08 |
| Johnstown,Pa. B2 | 10.55 |
| Kokomo,Ind. C16 | 10.55 |
| Minnequa,Colo. C10 | 10.30 |
| Monessen,Pa. P16 | 10.55 |
| Muncie,Ind. I-7 | 10.75 |
| Palmer,Mass. W12 | 10.85 |
| Roebling,N.J. R5 | 10.85 |
| So.SanFrancisco C10 | 10.90 |
| Waukegan,Ill. A7 | 10.55 |
| Worcester,Mass. A7,T6 | 10.85 |

| WIRE, Galv'd ACSR for Cores | |
|---|---|
| Bartonville,Ill. K4 | 9.50 |
| Buffalo W12 | 9.50 |
| Johnstown,Pa. B2 | 9.50 |
| Minnequa,Colo. C10 | 9.625 |
| Monessen,Pa. P16 | 9.50 |
| Muncie,Ind. I-7 | 9.70 |
| Portsmouth,O. D2 | 9.50 |
| Roebling,N.J. R5 | 9.80 |
| SparrowsPt.,Md. B2 | 9.60 |

| ROPE WIRE | (A) |
|---|---|
| Alton,Ill. L1 | 9.45 |
| Bartonville,Ill. K4 | 9.35 |
| Buffalo W12 | 9.35 |
| Fostoria,O. S1 | 9.35 |
| Johnstown,Pa. B2 | 9.35 |
| Monessen,Pa. P7, P16 | 9.35 |
| Muncie,Ind. I-7 | 9.55 |
| Palmer,Mass. W12 | 9.65 |
| Portsmouth,O. P12 | 9.35 |
| Roebling,N.J. R5 | 9.65 |
| SparrowsPt. B2 | 9.45 |
| Struthers,O. Y1 | 9.35 |
| Worcester J4, T6 | 9.65 |

(A) Plow and Mild Plow; add 0.25c for improved plow.

| WIRE, Tire Bead | |
|---|---|
| Alton,Ill. L1 | 12.75 |
| Bartonville,Ill. K4 | 12.65 |
| Monessen,Pa. P16 | 12.55 |
| Roebling,N.J. R5 | 12.85 |

| WIRE, Cold-Rolled Flat | |
|---|---|
| Anderson,Ind. G6 | 7.45 |
| Buffalo W12 | 7.45 |
| Cleveland A7 | 7.45 |
| Crawfordsville,Ind. M8 | 7.55 |
| Dover,O. G6 | 7.45 |
| Fostoria,O. S1 | 7.45 |
| Kokomo,Ind. C16 | 7.55 |
| FranklinPark,Ill. T6 | 7.60 |
| Massillon,O. R8 | 7.45 |
| Monessen,Pa. P7, P16 | 7.45 |
| Pawtkt.,R.I.(12) N8 | 7.75 |
| Trenton,N.J. R5 | 7.75 |
| Worcester A7, T6, W12 | 7.75 |

| WIRE, Merchant Quality (6 to 8 gage) | An'ld. | Galv. |
|---|---|---|
| Ala.City R2 | 6.675 | 7.075** |
| Aliquippa J5 | 6.675 | 7.20* |
| Atlanta A11 | 6.775 | 7.30 |
| Bartonville(48)K4 | 6.775 | 7.275 |
| Buffalo W12 | 6.675 | 7.075† |
| Cleveland A7 | 6.675 | .... |
| Crawfordsville M8 | 6.775 | 7.30 |
| Donora,Pa. A7 | 6.675 | 7.075† |
| Duluth,Minn. A7 | 6.675 | 7.075† |
| Fairfield T2 | 6.675 | 7.075† |
| Houston,Tex. S5 | 7.075 | 7.475 |
| Jacksonville,Fla. M8 | 7.20 | 7.73 |
| JohnstownB2(48) | 6.675 | 7.225* |
| Joliet,Ill. A7 | 6.675 | 7.075† |
| KansasCity,Mo.S5 | 7.275 | 7.675 |
| Kokomo C16 | 6.775 | 7.175† |
| LosAngeles B3 | 7.625 | .... |
| Minnequa C10 | 6.925 | 7.325** |
| Monessen P7(48) | 6.675 | 7.225 |
| Palmer W12 | 6.975 | 7.375† |
| Pitts.,Calif. C11 | 7.625 | 8.025† |
| Portsmouth,O.P12 | 6.675 | .... |
| Rankin A7 | 6.675 | 7.075† |
| So.Chi'go R2 | 6.675 | 7.075** |
| S.S.Frn.(48)C10 | 7.625 | 8.025** |
| Spar'wsPt.B2(48) | 6.775 | 7.325* |
| Steri'g(1)(48)N15 | 6.675 | 7.175 |
| Struthers,O. Y1 | 6.675 | 7.175 |
| Worcester A7 | 6.975 | .... |

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

| WOVEN FENCE, 9-15½ Ga. Col. | |
|---|---|
| Ala.City,Ala. R2 | 140** |
| Ala.City, 17 ga. R2 | 235** |
| Ala.City, 18 ga. R2 | 245** |
| Aliq'ppa,Pa.9-14½ga. J5 | 143* |
| Atlanta A11 | 145 |
| Bartonville,Ill.K4 | 144 |
| Crawfordsville,Ind. M8 | 145 |
| Donora,Pa. A7 | 140† |
| Duluth,Minn. A7 | 140† |
| Fairfield,Ala. T2 | 140† |
| Houston,Tex. S5 | 148 |
| Johnstown,Pa. B2 | 143 |
| Johnstown 17 ga.,6"B2 | 234 |
| Johnstown 4" B2 | 237 |
| Joliet,Ill. A7 | 140† |
| KansasCity,Mo. S5 | 152 |
| Kokomo,Ind. C16 | 142† |
| Minnequa,Colo. C10 | 148** |
| Monessen,Pa. 9 ga. P7 | 145 |
| Pittsburg,Calif. C11 | 163† |
| Rankin,Pa. A7 | 140† |
| So.Chicago,Ill. R2 | 140** |
| Sterling,Ill. (1) N15 | 142 |

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

| BALE TIES, Single Loop | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 149 |
| Atlanta A11 | 151 |
| Bartonville,Ill. K4 | 151 |
| Crawfordsville,Ind. M8 | 151 |
| Donora,Pa. A7 | 149 |
| Duluth,Minn. A7 | 149 |
| Fairfield,Ala. T2 | 149 |
| Joliet,Ill. A7 | 149 |
| KansasCity,Mo. S5 | 161 |
| Kokomo,Ind. C16 | 151 |
| Minnequa,Colo. C10 | 154 |
| Pittsburg,Calif. C11 | 173 |
| So.Chicago,Ill. R2 | 149 |
| So.SanFran.,Calif. C10 | 173 |
| SparrowsPoint,Md. B2 | 151 |
| Sterling,Ill.(1) N15 | 149 |

| WIRE, Barbed | Col. |
|---|---|
| AlabamaCity R2 | 153** |
| Aliquippa J5 | 150* |
| Atlanta A11 | 158 |
| Bartonville,Ill. K4 | 157 |
| Crawfordsville,Ind. M8 | 158 |
| Donora,Pa. A7 | 153† |
| Duluth,Minn. A7 | 153† |
| Fairfield,Ala. T2 | 153† |
| Houston,Tex. S5 | 161 |
| Johnstown,Pa. B2 | 156* |
| Joliet,Ill. A7 | 153† |
| KansasCity,Mo. S5 | 165 |
| Kokomo,Ind. C16 | 155† |
| Minnequa,Colo. C10 | 159** |
| Monessen,Pa. P7 | 157 |
| Pittsburg,Calif. C11 | 173† |
| Rankin,Pa. A7 | 153† |
| So.Chicago,Ill. R2 | 153** |
| S.SanFrancisco C10 | 176** |
| SparrowsPoint,Md. B2 | 158* |
| Sterling,Ill. (1) N15 | 155 |

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

| WIRE (16 gage) | An'ld. Stone | Galv. Stone |
|---|---|---|
| Ala.City R2 | 12.50 | 14.05** |
| Aliquippa J5 | 12.50 | 14.30* |
| Bartonville K4 | 12.60 | 14.35 |
| Buffalo W12 | 12.50 | .... |
| Cleveland A7 | 12.50 | .... |
| CrawfordsvilleM8 | 12.50 | 14.30 |
| Fostoria,O. S1 | 12.60 | 14.15 |
| Johnstown B2 | 12.50 | 14.35* |
| Kokomo C16 | 12.60 | 14.15† |
| Minnequa C10 | 12.75 | 14.45** |
| Palmer,Mas.W12 | 12.50 | 14.05† |
| Pitts.,Calif. C11 | 12.85 | 14.40† |
| SparrowsPt. B2 | 12.60 | 14.45* |
| Sterling(1) N15 | 12.50 | 14.25 |
| Waukegan A7 | 12.50 | 14.05† |
| Worcester A7 | 12.80 | .... |

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

| NAILS, Stock To dealers & mfrs. (7) | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 131 |
| Aliquippa,Pa. J5 | 131 |
| Atlanta A11 | 133 |
| Bartonville,Ill. K4 | 133 |
| Chicago,Ill. W13 | 131 |
| Cleveland A9 | 137 |
| Crawfordsville,Ind. M8 | 133 |
| Donora,Pa. A7 | 131 |
| Duluth,Minn. A7 | 131 |
| Fairfield,Ala. T2 | 131 |
| Galveston,Tex. D7 | 139 |
| Houston,Tex. S5 | 139 |
| Johnstown,Pa. B2 | 131 |
| Joliet,Ill. A7 | 131 |
| KansasCity,Mo. S5 | 143 |
| Kokomo,Ind. C16 | 133 |
| Minnequa,Colo. C10 | 136 |
| Monessen,Pa. P7 | 131 |
| Pittsburg,Calif. C11 | 150 |
| Rankin,Pa. A7 | 131 |
| So.Chicago,Ill. R2 | 131 |
| SparrowsPt.,Md. B2 | 133 |
| Sterling,Ill. (1) N15 | 131 |
| Worcester,Mass. A7 | 137 |

| NAILS, CUT (100 lb keg) To dealers (33) | |
|---|---|
| Conshohocken,Pa. A3 | $8.00 |
| Wheeling,W.Va. W10 | 8.00 |

| STAPLES, Polished Stock To dealers & mfrs. (7) | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 133 |
| Aliquippa,Pa. J5 | 133 |
| Atlanta A11 | 135 |
| Bartonville,Ill. K4 | 135 |
| Crawfordsville,Ind. M8 | 135 |
| Donora,Pa. A7 | 133 |
| Duluth,Minn. A7 | 133 |
| Fairfield,Ala. T2 | 133 |
| Johnstown,Pa. B2 | 133 |
| Joliet,Ill. A7 | 133 |
| Kokomo,Ind. C16 | 135 |
| Minnequa,Colo. C10 | 138 |
| Monessen,Pa. P7 | 133 |
| Pittsburg,Calif. C11 | 152 |
| Rankin,Pa. A7 | 133 |
| So.Chicago,Ill. R2 | 133 |
| SparrowsPt.,Md. B2 | 135 |
| Sterling,Ill. (1) N15 | 133 |
| Worcester,Mass. A7 | 139 |

## FENCE POSTS

| | Col. |
|---|---|
| ChicagoHts.,Ill. C2, I-2 | 145 |
| Duluth,Minn. A7 (49) | 145 |
| Franklin,Pa. F5 | 145 |
| Johnstown,Pa. B2 | 145 |
| Marion,O. P11 | 145 |
| Minnequa,Colo. C10 | 150 |
| Moline,Ill. R2 | 145 |
| So.Chicago,Ill. R2 | 145 |
| Tonawanda,N.Y. B12 | 145 |
| Williamsport,Pa. S19 | 148 |

## SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | 2 | | 2½ | | 3 | | 3½ | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | | $1.48 | | $1.92 | |
| Pounds Per Ft | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | | 14.81 | | 19.18 | |
| | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv |
| Aliquippa, Pa. J5 (‡) | 15.75 | list | 19.75 | 2.5 | 22.25 | 5 | 23.75 | 6.5 | 23.75 | 6.5 | 23 | 5.75 | 25.5 | 8.25 |
| Ambridge, Pa. N2 (†) | 15.75 | .... | 19.75 | .... | 22.25 | .... | 23.75 | .... | 23.75 | .... | 23 | .... | 25.5 | .... |
| Lorain, O. N3 (*) | 15.75 | 4.5 | 19.75 | 5.5 | 22.25 | 8 | 23.75 | 9.5 | 23.75 | 9.5 | 23 | 8.75 | 25.5 | 11.25 |
| Youngstown Y1 (††) | 15.75 | list | 19.75 | 2.5 | 22.25 | 5 | 23.75 | 6.5 | 23.75 | 6.5 | 23 | 5.75 | 25.5 | 8.25 |

## ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Youngstown R2 (**) | 15.75 | 1.5 | 19.75 | 3.5 | 22.25 | 6.0 | 23.75 | 7.5 | 23.75 | 7.5 | 23 | 7.5 | 25.5 | 6.75 |

## BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | ⅛ | | ¼ | | ⅜ | | ½ | | ¾ | | 1 | | 1¼ | | 1½ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 5.5c | | 6c | | 6c | | 8.5c | | 11.5c | | 17c | | 23c | | 27.5c | |
| Pounds Per Ft | 0.24 | | 0.42 | | 0.57 | | 0.85 | | 1.13 | | 1.68 | | 2.28 | | 2.73 | |
| | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv |
| Aliquippa, Pa. J5 (‡) | .... | .... | .... | .... | .... | .... | 26.25 | 10 | 29.25 | 14 | 31.75 | 17.5 | 34.25 | 18.5 | 34.75 | 19.5 |
| Alton, Ill. L1 (§) | .... | .... | .... | .... | .... | .... | 24.25 | 9 | 27.25 | 13 | 29.75 | 16.5 | 32.25 | 17.5 | 32.75 | 18.25 |
| Benwood, W. Va. W10(††) | 25.5 | +0.25 | 17.75 | +5.5 | 10.25 | +10 | 26.25 | 11 | 29.25 | 15 | 31.75 | 18.5 | 34.25 | 19.5 | 34.75 | 20.25 |
| Butler, Pa. F6 | 26.5 | −1.75 | 19.5 | +2.75 | 12.5 | +6.25 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Etna, Pa. N2 (†) | .... | .... | .... | .... | .... | .... | 26.25 | 7 | 29.25 | 11 | 31.75 | 14.5 | 34.25 | 16.25 | 34.75 | 17.25 |
| Fairless, Pa. N3 | .... | .... | .... | .... | .... | .... | 24.25 | .. | 27.25 | .. | 29.75 | .. | 32.25 | .... | 32.75 | .... |
| Fontana, Calif. K1 (§) | .... | .... | .... | .... | .... | .... | 13.25 | +3 | 16.25 | 1 | 18.75 | 4.5 | 21.25 | 5.5 | 21.75 | 6.5 |
| Ind. Harbor Y1 (††) | .... | .... | .... | .... | .... | .... | 25.25 | 9 | 28.25 | 13 | 30.75 | 16.5 | 33.25 | 17.5 | 33.75 | 18.5 |
| Lorain, O. N3 (*) | .... | .... | .... | .... | .... | .... | 26.25 | 16 | 29.25 | 20 | 31.75 | 23.5 | 34.25 | 23 | 34.75 | 24 |
| Sharon, Pa. S4 (‡) | 26.5 | −0.25 | 19.50 | +4.25 | 12.5 | +8.5 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Sharon, Pa. M6 | .... | .... | .... | .... | .... | .... | 26.25 | 11 | 29.25 | 15 | 31.75 | 18.5 | 34.25 | 19.25 | 34.75 | 20.25 |
| Sparrows Pt., Md. B2 (§) | 24.5 | +1.75 | 17.5 | +6.25 | 10.5 | +10.5 | 24.25 | 8 | 27.25 | 12 | 29.75 | 15.5 | 32.25 | 16.5 | 32.75 | 17.5 |
| Youngstown R2 (**) | .... | .... | .... | .... | .... | .... | 26.25 | 12 | 29.25 | 16 | 31.75 | 19.5 | 34.25 | 20.0 | 34.75 | 21.0 |
| Youngstown Y1 (††) | .... | .... | .... | .... | .... | .... | 26.25 | 10 | 29.25 | 14 | 31.75 | 17.5 | 34.25 | 18.5 | 34.75 | 19.5 |
| Wheatland, Pa. W9 (§) | 24.5 | +1.75 | 17.5 | +6.25 | 10.5 | +10.5 | 26.25 | 10 | 29.25 | 14 | 31.75 | 17.5 | 34.25 | 18.5 | 34.75 | 19.5 |

| Size—Inches | 2 | | 2½ | | 3 | | 3½ | | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | |
| Pounds Per Ft | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | |
| | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv | Blk | Galv |
| Aliquippa, Pa. J5 (‡) | 35.25 | 20 | 36.75 | 20 | 36.75 | 20 | .... | .... | .... | .... |
| Alton, Ill. L1 (§) | 33.25 | 18.75 | 34.75 | 18 | 34.75 | 18 | .... | .... | .... | .... |
| Benwood, W. Va. W10(††) | 35.25 | 20.75 | 36.75 | 20.5 | 36.75 | 20.5 | 27.75 | 11 | 27.75 | 11 |
| Etna, Pa. N2 (†) | 35.25 | 17.25 | 36.75 | 18.5 | 36.75 | 18.5 | 27.75 | 9 | 27.75 | 9 |
| Fairless, Pa. N3 | 33.25 | .... | 34.75 | .... | 34.75 | .... | 25.75 | .... | 25.75 | .... |
| Fontana, Calif. K1 (§) | 22.25 | 7 | 23.75 | 7 | 23.75 | 7 | .... | .... | .... | .... |
| Ind. Harbor, Ind. Y1 (††) | 34.25 | 19 | 35.75 | 19 | 35.75 | 19 | .... | .... | .... | .... |
| Lorain, O. N3 (*) | 35.25 | 24.5 | 36.75 | 23 | 36.75 | 23 | .... | .... | .... | .... |
| Sharon, Pa. M6 | 35.25 | 20.75 | 36.75 | 20.5 | 36.75 | 20.5 | .... | .... | .... | .... |
| Sparrows Pt., Md. B2 (§) | 32.25 | 18 | 34.75 | 18 | 34.75 | 18 | 25.75 | 8.5 | 25.75 | 8.5 |
| Youngstown R2 (**) | 35.25 | 21.5 | 36.75 | 21.0 | 36.75 | 21.0 | 27.75 | 11.5 | 27.75 | 11.5 |
| Youngstown Y1 (††) | 35.25 | 20 | 36.75 | 20 | 36.75 | 20 | .... | .... | .... | .... |
| Wheatland, Pa. W9 (‡) | 35.25 | 20 | 36.75 | 20 | 36.75 | 20 | .... | .... | .... | .... |

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

## BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

| O.D. In. | B.W. Gage | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. |
|---|---|---|---|---|
| 1 | 13 | .... | 19.02 | 18.44 |
| 1¼ | 13 | .... | 22.53 | 18.12 |
| 1½ | 13 | 20.65 | 24.91 | 20.01 |
| 1¾ | 13 | 24.40 | 29.43 | 23.66 |
| 2 | 13 | 27.34 | 32.98 | 26.51 |
| 2¼ | 13 | 30.80 | 37.15 | 29.86 |
| 2¼ | 12 | 33.43 | 40.32 | 32.41 |
| 2½ | 12 | 36.82 | 44.41 | 35.70 |
| 2¾ | 12 | 39.87 | 48.09 | 38.66 |
| 3 | 12 | 42.52 | 51.28 | 41.23 |

## RAILWAY MATERIALS

| RAILS | Std. No. 1 | Std. No. 2 | Std. All No. 2 | Tee Rails 60 lb Under |
|---|---|---|---|---|
| Bessemer,Pa. U5 | 4.325 | 4.225 | 4.275 | 5.20 |
| Ensley,Ala. T2 | 4.325 | 4.225 | .... | 5.20 |
| Fairfield,Ala. T2 | .... | .... | .... | 5.20 |
| Gary,Ind. U5 | 4.325 | 4.225 | 4.275 | .... |
| Huntington,W.Va. W7 | .... | .... | .... | 5.20 |
| Indiana Harbor,Ind. I-2 | 4.325 | 4.225 | 4.275 | .... |
| Johnstown,Pa. B2 | .... | .... | ....(16)5.20 | |
| Lackawanna,N.Y. B2 | 4.325 | 4.225 | .... | 5.20 |
| Minnequa,Colo. C10 | 4.325 | 4.125 | .... | 5.70 |
| Steelton,Pa. B2 | 4.325 | 4.225 | .... | .... |
| Williamsport,Pa. S19 | .... | .... | .... | 5.20 |

| TIE PLATES | |
|---|---|
| Fairfield,Ala. T2 | 5.125 |
| Gary,Ind. U5 | 5.125 |
| Ind Harbor,Ind. I-2 | 5.125 |
| Lackawanna,N.Y. B2 | 5.125 |
| Minnequa,Colo. C10 | 5.125 |
| Pittsburg,Calif. C11 | 5.275 |
| Seattle B3 | 5.275 |
| Steelton,Pa. B2 | 5.125 |
| Torrance,Calif. C11 | 5.275 |

| TRACK BOLTS (20) Treated | |
|---|---|
| Cleveland R2 | 11.00 |
| KansasCity, Mo. S5 | 11.00 |
| Lebanon,Pa. B2 | 11.00 |
| Minnequa,Colo. C10 | 11.00 |
| Pittsburgh O3, P14 | 11.00 |
| Seattle,Wash. B3 | 11.50 |

| JOINT BARS | |
|---|---|
| Bessemer,Pa. U5 | 5.275 |
| Fairfield,Ala. T2 | 5.275 |
| Ind Harbor,Ind. I-2 | 5.275 |
| Joliet,Ill. U5 | 5.275 |
| Lackawanna,N.Y. B2 | 5.275 |
| Minnequa,Colo. C10 | 5.275 |
| Steelton,Pa. B2 | 5.275 |

| AXLES | |
|---|---|
| Ind Harbor,Ind. S13 | 6.50 |
| Johnstown,Pa. B2 | 6.50 |

| STANDARD TRACK SPIKES | |
|---|---|
| Fairfield,Ala. T2 | 7.05 |
| Ind.Harbor,Ind. I-2, Y1 | 7.05 |
| KansasCity,Mo. S5 | 7.30 |
| Lebanon,Pa. B2 | 7.05 |
| Minnequa,Colo. C10 | 7.05 |
| Pittsburgh J5 | 7.05 |
| Seattle B3 | 7.55 |
| So.Chicago,Ill. R2 | 7.05 |
| Struthers,O. Y1 | 7.05 |
| Youngstown R2 | 7.05 |

## RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

## WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

## BOLTS, NUTS

### CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

| | |
|---|---|
| 6 in. and shorter: | |
| ½-in. & smaller diam. | 4 |
| ⅝-in. & ¾-in. | 5 |
| ⅞-in. and larger | 3 |
| Longer than 6 in.: | |
| All diams. | +4 |
| Lag bolts, all diams.: | |
| 6 in. and shorter | 12 |
| Over 6 in. long | 8 |
| Ribbed Necked Carriage | 5 |
| Blank | 25 |
| Plow | 25 |
| Step, Elevator, Tap and Sleigh Shoe | 12 |
| Tire Bolts | List |
| Boiler & Fitting-Up Bolts | 23 |

### NUTS

| | |
|---|---|
| H.P. & C.P., regular & heavy: | |
| Square, all sizes | 58 |
| H.P., Hex, regular & heavy: | |
| ¾" and smaller | 58 |
| ⅞" to 1⅛", inclusive | 60 |
| 1¼" to 1½", inclusive | 62 |
| 1⅝" and larger | 58 |
| C.P. Hex, regular heavy: | |
| All sizes | 58 |
| Hot Galv. Nuts (all types): | |
| ¾" and smaller | 40 |
| ⅞" to 1½", inclusive | 42 |
| Finished Hex Nuts: | |
| New standard, all sizes | 58 |
| Semifinished & Slotted Hex | |
| Regular and heavy, all sizes | 58 |

### SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

| | |
|---|---|
| 1 in. diam. x 6 in. and shorter | 34 |
| 1 in. and smaller diam. x over 6 in. | 20 |

### HEADLESS SET SCREWS

(Packaged; per cent off list)

| | |
|---|---|
| No. 10 and smaller | 34 |
| ¼-in. diam. & larger | 14 |
| N.F. thread, all diams. | 8 |

### STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

| | |
|---|---|
| Plain finish | 47.5 & 10 |
| Plated finishes | 30 & 10 |

### HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

| | |
|---|---|
| 6 in. or shorter: | |
| ⅝-in. & smaller | 38 |
| ¾-in. through 1 in. | 22 |
| Longer than 6 in.: | |
| ⅝-in. and smaller | 20 |
| ¾-in. through 1 in. | 7 |

## METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

| | |
|---|---|
| Sponge Iron: | Cents |
| 98+% Fe, annealed | 18.00 |
| Unannealed | |
| Minus 100 mesh | 14.50 |
| Minus 35 mesh | 10.50 |
| Minus 20 mesh | 10.00 |
| Swedish c.i.f. N.Y., c.l., in bags | 11.25 |
| Domestic (Swedish), f.o.b. Riverton, N.J., in bags | 11.25 |
| Electrolytic iron: | |
| Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in. | 23.00 |
| Annealed, 99.5% Fe | 42.50 |
| Unannealed (99+% Fe) | 36.50 |
| Unannealed (99+% Fe) (minus 325 mesh) | 53.50 |
| Powder Flakes (minus 16, plus 100 mesh) | 31.00 |
| Carbonyl Iron: | |
| 97.9-99.8% size 5 to 10 microns | $3.00-148.00 |
| Aluminum: | |
| Atomized, 500 lb drums, freight allowed: | |
| Carlots | 31.00 |
| Ton lots | 34.00 |
| Antimony, 500 lb lots | 32.00* |
| Brass, ¼-ton lots | 28.75-37.50† |
| Bronze, ¼-ton lots | 50.00-60.00‡ |
| Copper: | |
| Electrolytic | 13.50* |
| Reduced | 13.50* |
| Lead | 7.50* |
| Magnesium | 54.00-56.00 |
| Manganese: | |
| Minus 35 mesh | 61.00 |
| Minus 100 mesh | 67.00 |
| Minus 200 mesh | 72.00 |
| Nickel, unannealed | 89.50 |
| Nickel-Silver, ¼-ton lots | 44.00-49.00‡ |
| Nickel-Silver, ¼-ton lots | 46.75** |
| Phosphor-Bronze, ¼-ton lots | 58.50 |
| Silicon | 43.50 |
| Solder | 8.50* |
| Stainless Steel, 302 | 91.00 |
| Tin | 14.50* |
| Zinc, ¼-ton lots | 15.00-28.75† |
| Tungsten | Dollars |
| Melting grade, 99% 60 to 200 mesh; 1000 lb and over | 4.95 |
| Less than 1000 lb | 5.10 |
| Chromium, electrolytic 99.9% Cr min. | 3.50 |

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

## Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16", 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 2 5/16" 4.25c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only, 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.55c for H.S.L.A.
(31) Rates, dedd. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.00c for cut lengths.
(35) 12" and narrower.
(36) 5⅛" and narrower.
(37) 13 gage & lighter, 60" & narrower.
(38) 14 gage & lighter, 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.025", 0.025" and heavier, 0.25c higher.
(41) 5.10c for cut lengths.
(48) 6.7 gage.
(49) T post; deduct 2 cols for U post.

## STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

| AISI Type | Rerolling Ingots | Rerolling Slabs, Billets | Forging Billets | Seamless Tube Billets | H.R. Strip | Shapes; H.R. & C.F. Bars; Wire | Plates | Sheets | C.R. Strip; Flat Wire |
|---|---|---|---|---|---|---|---|---|---|
| 301 | 16.25 | 20.50 | 29.50 | 34.25 | 29.75 | 35.25 | 37.25 | 46.25 | 38.25 |
| 302 | 17.25 | 22.75 | 29.75 | 34.50 | 32.00 | 35.50 | 37.50 | 46.50 | 41.50 |
| 302B | 18.50 | 24.50 | 30.50 | 34.50 | 35.00 | 35.50 | 37.50 | 48.75 | 44.75 |
| 303 | 18.75 | 24.75 | 32.25 | 37.25 | 36.75 | 38.25 | 39.75 | 48.75 | 45.50 |
| 304 | 18.25 | 23.75 | 31.00 | 36.00 | 34.25 | 37.25 | 39.75 | 48.75 | 43.75 |
| 304L | .... | .... | 36.75 | .... | .... | 42.75 | 45.25 | 54.25 | 49.00 |
| 306 | 19.50 | 25.50 | .... | 36.25 | 37.00 | 37.50 | 42.00 | 51.75 | 46.75 |
| 308 | 19.75 | 26.25 | 35.25 | 40.75 | 38.00 | 42.00 | 46.00 | 55.25 | 48.00 |
| 309 | 26.50 | 34.75 | 43.25 | 49.25 | 49.25 | 50.50 | 53.75 | 63.50 | 62.00 |
| 309S | 28.50 | 37.50 | 47.50 | 54.50 | 54.00 | 55.50 | 59.00 | 68.50 | 68.50 |
| 310 | 33.00 | 43.25 | 56.75 | 66.25 | 67.50 | 67.50 | 69.00 | 72.25 | 78.75 |
| 314 | .... | .... | .... | .... | .... | .... | 69.00 | 74.50 | .... |
| 316 | 28.00 | 36.25 | 46.75 | 54.50 | 55.00 | 55.50 | 59.00 | 64.50 | 66.50 |
| 316L | .... | .... | 52.50 | .... | .... | 61.00 | 64.25 | 70.00 | 72.00 |
| 317 | 33.00 | 43.50 | 58.25 | 66.75 | 67.50 | 68.25 | 70.75 | 77.00 | 79.25 |
| 318 | 33.50 | 44.00 | 55.25 | 64.50 | 66.25 | 65.50 | 68.75 | 78.00 | 80.25 |
| 321 | 22.75 | 29.50 | 35.25 | 40.75 | 42.00 | 42.00 | 46.00 | 55.50 | 54.50 |
| 330 | .... | .... | 58.00 | .... | .... | 68.50 | 70.00 | 73.75 | 77.75 |
| 347 | 24.50 | 32.25 | 39.50 | 45.75 | 46.50 | 46.75 | 51.25 | 60.75 | 59.25 |
| 403 | .... | .... | 27.00 | 30.75 | .... | 32.00 | 34.25 | 44.00 | 41.25 |
| 405 | 16.50 | 21.75 | 25.25 | 29.25 | 30.50 | 30.25 | 31.75 | 42.50 | 39.75 |
| 410 | 14.00 | 18.25 | 24.00 | 27.75 | 26.25 | 28.75 | 30.00 | 40.75 | 34.25 |
| 416 | .... | .... | 24.50 | 28.25 | .... | 29.25 | 30.50 | 41.25 | 41.25 |
| 420 | 22.00 | 28.50 | 29.25 | 34.00 | 35.50 | 35.00 | 38.50 | 49.25 | 52.75 |
| 430 | 14.25 | 18.50 | 24.50 | 28.25 | 27.00 | 29.25 | 30.50 | 43.50 | 34.75 |
| 430F | .... | 18.75 | 25.00 | 28.75 | .... | 29.75 | 31.00 | 44.00 | 44.00 |
| 431 | 14.50 | 28.50 | 25.00 | 28.25 | 27.50 | 29.25 | 30.50 | 44.00 | 35.25 |
| 440A,B,C | .... | 28.50 | 29.25 | 34.00 | .... | 35.00 | 38.50 | 49.25 | 52.75 |
| 442 | .... | .... | 28.00 | .... | .... | 30.50 | 35.25 | 48.25 | 47.75 |
| 446 | .... | .... | 33.75 | 38.25 | 53.00 | 39.50 | 40.75 | 59.75 | 71.00 |
| 501 | .... | .... | 14.00 | 14.50 | 21.25 | 16.00 | 18.25 | 30.50 | 29.00 |
| 502 | .... | .... | 15.25 | 16.00 | 22.25 | 17.00 | 20.00 | 31.75 | 30.00 |

**Stainless Steel Producers Are:** Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ulbrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

## CLAD STEEL

| Cladding Stainless | Plates—Carbon Base 10% | Plates—Carbon Base 20% | Sheets—Carbon Base 20% | Sheets—Copper Base Both Sides |
|---|---|---|---|---|
| 302 | .... | 31.00 | 31.00 | 77.00 |
| 304 | 27.60 | 32.50-32.70 | 32.50 | 77.00 |
| 310 | 36.50 | 41.00 | ..... | 144.00 |
| 316 | 32.60 | 37.70-42.75 | 42.75 | .... |
| 318 | 37.00 | 42.20 | ..... | .... |
| 321 | 29.30 | 34.40-37.00 | 37.00 | 111.00 |
| 347 | 30.40 | 35.50-40.50 | 40.50 | 130.00 |
| 405 | 23.40 | 30.60 | ..... | .... |
| 410 | 22.90 | 30.10 | ..... | .... |
| 430 | 22.90 | 30.10 | ..... | .... |
| Inconel | 41.23 | 54.18 | ..... | 165.00 |
| Nickel | 37.50 | 50.90 | ..... | .... |
| Monel | 38.90 | 51.80 | ..... | .... |
| Copper* | .... | ..... | 46.00 | .... |

| | Strip, Carbon Base—Cold-Rolled 10% | Strip, Carbon Base—Cold-Rolled Both Sides | Strip, Carbon Base—Hot-Rolled 10% | Strip, Carbon Base—Hot-Rolled Both Sides |
|---|---|---|---|---|
| Copper* | .... | ..... | 46.00 | .... |

*Deoxidized. Production point: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

## TOOL STEEL

| Grade | $ per lb | Grade | $ per lb |
|---|---|---|---|
| Regular Carbon | 0.25 | 5% Cr Hot Work | 0.39 |
| Extra Carbon | 0.30 | W-Cr Hot Work | 0.41 |
| Special Carbon | 0.355 | V-Cr Hot Work | 0.42-.43 |
| Oil Hardening | 0.37-.390 | Hi-Carbon-Cr | 0.665-.70 |

| Grade by Analysis (%) W | Cr | V | Co | Mo | $ per lb |
|---|---|---|---|---|---|
| 20 | 4.25 | 1.6 | 12.25 | .... | 3.875 |
| 18 | 4.25 | 1 | 4.75 | .... | 2.160-2.320 |
| 18 | 4 | 2 | 9 | .... | 2.515 |
| 18 | 4 | 2 | .... | .... | 1.640 |
| 18 | 4 | 1 | .... | .... | 1.480 |
| 13.5 | 4 | 3 | .... | .... | 1.735 |
| 6.4 | 4.5 | 1.9 | .... | 5 | 1.005-1.055 |
| 6 | 4 | 3 | .... | 6 | 1.240 |
| 2 | 1.4 | 1.2 | .... | .... | 0.495 |
| 1.5 | 4 | 1 | .... | 8.5 | 0.865-0.895 |

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

## PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| *Birmingham District* | | | | |
| AlabamaCity R2 | 52.38 | 52.88 | .... | .... |
| Birmingham R2 | 52.38 | 52.88 | .... | .... |
| Birmingham U6 | .... | 52.88 | .... | .... |
| Woodward,Ala. W15 | 52.38 | 52.88 | 56.50† | .... |
| Cincinnati, del. | .... | 60.43 | .... | .... |
| *Buffalo District* | | | | |
| Buffalo R2, H1 | 56.00 | 56.50 | 57.00 | .... |
| Tonawanda,N.Y. W12 | 56.00 | 56.50 | 57.00 | .... |
| No. Tonawanda,N.Y. T9 | .... | 56.50 | 57.00 | .... |
| Boston, del. | 66.65 | 67.15 | 67.65 | .... |
| Rochester,N.Y., del. | 59.02 | 59.52 | 60.02 | .... |
| Syracuse,N.Y., del. | 60.12 | 60.62 | 61.12 | .... |
| *Chicago District* | | | | |
| Chicago I-3 | 56.00 | 56.50 | 56.50 | 57.00 |
| Gary,Ind. U5 | 56.00 | .... | 56.50 | .... |
| IndianaHarbor,Ind. I-2 | 56.00 | .... | 56.50 | .... |
| So.Chicago,Ill. W14, Y1 | 56.00 | 56.50 | 56.50 | .... |
| So.Chicago,Ill. U5 | 56.00 | .... | 56.50 | 57.00 |
| Milwaukee, del. | 58.17 | 58.67 | 58.67 | 59.17 |
| Muskegon,Mich., del. | .... | 62.80 | 62.80 | .... |
| *Cleveland District* | | | | |
| Cleveland A7 | 56.00 | 56.50 | 56.50 | 57.00 |
| Cleveland R2 | 56.00 | 56.50 | 56.50 | .... |
| Akron,O., del. from Cleve. | 58.75 | 59.25 | 59.25 | 59.75 |
| Lorain,O. N3 | 56.00 | .... | .... | 57.00 |
| *Mid-Atlantic District* | | | | |
| Bethlehem,Pa. B2 | 58.00 | 58.50 | 59.00 | 59.50 |
| New York, del. | .... | 62.28 | 62.78 | .... |
| Newark, del. | 61.02 | 61.52 | 62.02 | 62.52 |
| Birdsboro,Pa. B10 | 58.00 | 58.50 | .... | .... |
| Steelton,Pa. B2 | 58.00 | 58.50 | 59.00 | 59.50 |
| Swedeland,Pa. A3 | 58.00 | 58.50 | 59.00 | 59.50 |
| Philadelphia, del. | 59.66 | 60.16 | 60.66 | 61.16 |
| Troy,N.Y. R2 | 58.00 | 58.50 | 59.00 | .... |
| *Pittsburgh District* | | | | |
| Neville Island,Pa. P6 | 56.00 | 56.50 | 56.50 | 57.00 |
| Pittsburgh (N&S sides), Ambridge, Aliquippa, del. | 57.37 | 57.87 | 57.87 | 58.37 |
| McKeesRocks, del. | 57.04 | 57.54 | 57.54 | 58.04 |
| Lawrenceville,Homestead, Wilmerding,Monaco, del. | 57.66 | 58.16 | 58.16 | 58.66 |
| Verona,Trafford, del. | 58.19 | 58.69 | 58.69 | 59.19 |
| Brackenridge, del. | 58.45 | 58.95 | 58.95 | 59.45 |
| Bessemer,Pa. U5 | 56.00 | .... | 56.50 | 57.00 |
| Clairton,Rankin,So.Duquesne,Pa. U5 | 56.00 | .... | .... | .... |
| McKeesport,Pa. N3 | 56.00 | .... | .... | 57.00 |
| Midland,Pa. C18 | 56.00 | .... | .... | .... |
| Monessen,Pa. P7 | 56.00 | .... | .... | .... |
| *Youngstown District* | | | | |
| Hubbard,O. Y1 | .... | .... | 56.50 | .... |
| Sharpsville,Pa. S6 | 56.00 | 56.50 | 56.50 | 57.00 |
| Youngstown Y1 | .... | .... | 56.50 | 57.00 |
| Youngstown U5 | 56.00 | .... | .... | 57.00 |
| Mansfield,O., del. | 60.90 | .... | 61.40 | 61.90 |
| Duluth I-3 | 56.00 | 56.50 | 56.50 | 57.00 |
| Erie,Pa. I-3 | 56.00 | 56.50 | 56.50 | 57.00 |
| Everett,Mass. E1 | 62.50 | 61.25 | 63.50 | .... |
| Fontana,Calif. K1 | 62.00 | 62.50 | .... | .... |
| Geneva,Utah C11 | 56.00 | 56.50 | .... | .... |
| GraniteCity,Ill. G4 | 57.90 | 58.40 | 58.90 | .... |
| Ironton,Utah C11 | 56.00 | 56.50 | .... | .... |
| LoneStar,Texas L6 | 52.00 | 52.50* | 52.50 | .... |
| Minnequa,Colo. C10 | 58.00 | 59.00 | 59.00 | .... |
| Rockwood,Tenn. T3 | .... | .... | 56.50 | .... |
| Toledo,O. I-3 | 56.00 | 56.50 | 56.50 | 57.00 |
| Cincinnati, del. | 61.76 | 62.26 | .... | .... |

*Low phos. southern grade. †Phos., 0.30 max.

### PIG IRON DIFFERENTIALS

*Silicon:* Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

*Phosphorus:* Deduct 38 cents per ton for P content of 0.70% and over.

*Manganese:* Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

*Nickel:* Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

### BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

| | |
|---|---|
| Jackson,O. G2, J1 | $67.00 |
| Buffalo H1 | 68.25 |

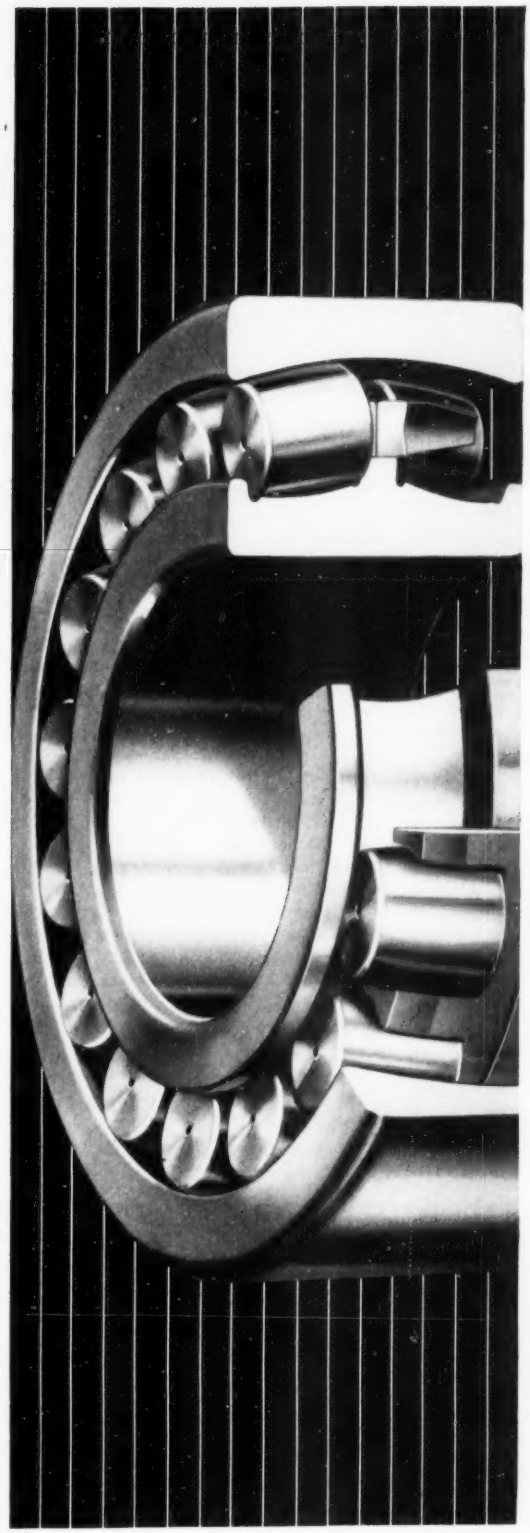
### ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

| | |
|---|---|
| NiagaraFalls, N.Y. P15 | $87.50 |
| Keokuk,Iowa, Openhearth & Fdry, freight allowed K2 | 92.00 |
| Keokuk, OH & Fdry, 12¼ lb piglets, 16% Si, frt, allowed K2 | 95.00 |
| Wenatchee,Wash. OH & Fdry, freight allowed K2 | 92.00 |

### LOW PHOSPHORUS PIG IRON, Gross Ton

| | |
|---|---|
| Cleveland, Intermediate, A7 | $61.00 |
| Rockwood,Tenn. T3 | 70.00 |
| Steelton,Pa. B2 | 64.00 |
| Philadelphia, del. | 64.00 |
| Troy,N.Y. R2 | 64.00 |

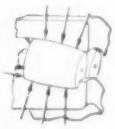


# why it pays to specify

# TORRINGTON

## Spherical Roller Bearings

**Uniform, close control of precision-ground contact surfaces**—for even load distribution and maximum bearing life.

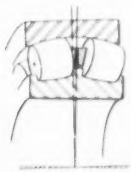


**Accurate geometrical conformity between races and rollers**—for ultimate load carrying capacity and performance.

**Races and rollers heat treated according to the most advanced metallurgical procedures**—for maximum durability.

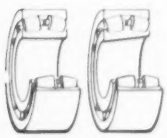
**Individual one-piece cage for each path of rollers**—assures freedom of operation.

**Integral flange on inner race**—to give radial stability and positioning for thrust loads—both essential to satisfactory performance.



**Self-aligning**—for continuous, free-rolling service under shock loads and at sustained speeds.

**Unit assembly**—for easy, economical handling.



**Available from stock with either straight or tapered bore**—for shaft or adapter mounting.

***These are advantages that give you long, efficient, low-maintenance service in the toughest heavy-duty application.*** **To get maximum value for your bearing dollar,** ***specify TORRINGTON Spherical Roller Bearings.***

THE TORRINGTON COMPANY

South Bend 21, Ind. • Torrington, Conn.

**TORRINGTON** *SPHERICAL ROLLER* **BEARINGS**

**Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers**

## WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

| | SHEETS | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hot Rolled | Cold Rolled | Gal. 10 Ga.† | H.R.* | C.R.* | H.R. Rds. | C.F. Rds.‡ | H.R. Alloy 4140††§ | Standard Structural Shapes | Carbon | Floor |
| Baltimore | 6.20 | 7.12 | 7.36 | 7.00 | ... | 6.86 | 8.17¶ | 12.04 | 6.98 | 6.85 | 7.98 |
| Birmingham | 6.10 | 7.00 | 8.00# | 6.30 | ... | 6.15 | 8.90 | .... | 6.35 | 6.35 | 8.25 |
| Boston | 6.89 | 7.83 | 9.18 | 7.13 | ... | 6.87 | 8.35 | 12.28 | 7.06 | 7.13 | 8.26 |
| Buffalo | 6.18 | 7.15 | 8.65 | 6.79 | ... | 6.35 | 7.70 | 12.17 | 6.59 | 6.68 | 7.88 |
| Charlotte, N. C. | 6.95 | 7.80 | 8.69 | 6.90 | ... | 7.10 | 8.37 | .... | 7.10 | 7.10 | 8.37 |
| Chicago | 6.18 | 7.12 | 7.95 | 6.42 | ... | 6.28 | 7.30 | 11.75 | 6.46 | 6.33 | 7.46 |
| Cincinnati | 6.51 | 7.19 | 7.95 | 6.72 | ... | 6.58 | 7.66 | 12.17 | 6.93 | 6.80 | 7.88 |
| Cleveland | 6.18 | 7.12 | 7.90 | 6.58 | ... | 6.34 | 7.40 | 11.89 | 6.79 | 6.50 | 7.79 |
| Detroit | 6.38 | 7.31 | 8.22 | 6.71 | 7.36 | 6.56 | 7.60 | 12.12 | 6.93 | 6.80 | 7.80 |
| Erie, Pa. | 6.13 | ... | 8.15 | 6.38 | ... | 6.23 | 7.50¶ | .... | 6.50 | 6.36 | 7.79 |
| Houston | 7.15 | 7.80 | 9.40 | 7.45 | 9.30 | 7.45 | 9.30 | .... | 7.35 | 7.20 | 8.55 |
| Los Angeles | 7.25 | 9.00 | 9.35 | 7.55 | 11.20 | 7.15 | 9.10 | 13.05 | 7.35 | 7.20 | 9.25 |
| Milwaukee | 6.35 | 7.29 | 8.12 | 6.59 | ... | 6.45 | 7.57 | 11.92 | 6.63 | 6.50 | 7.63 |
| Moline, Ill. | 6.53 | 7.47 | 8.35 | 6.77 | ... | 6.63 | 7.65 | .... | 6.81 | 6.68 | ... |
| New York | 6.78 | 7.75 | 8.37 | 7.16 | ... | 7.06 | 8.43¶ | 12.14 | 6.90 | 6.99 | 8.30 |
| Norfolk, Va. | 6.90 | .... | .... | 7.00 | .... | 7.00 | 8.50 | .... | 7.00 | 7.00 | 7.85 |
| Philadelphia | 6.35 | 7.13 | 8.16 | 7.02 | 8.80 | 6.87 | 8.19¶ | 11.89 | 6.67 | 6.63 | 7.65** |
| Pittsburgh | 6.18 | 7.12 | 8.00 | 6.55 | ... | 6.28 | 7.65 | 11.89 | 6.46 | 6.33 | 7.46 |
| Portland, Oreg. | 7.90 | 8.45 | 9.15 | 7.65 | ... | 7.35 | 10.65 | .... | 7.25 | 7.30 | 9.15 |
| Richmond, Va. | 6.50 | .... | 8.67 | 7.10 | ... | 7.05 | 8.20 | .... | 7.10 | 6.85 | 8.20 |
| St. Louis | 6.48 | 7.42 | 8.25 | 6.72 | ... | 6.58 | 7.70 | 12.05 | 6.86 | 6.73 | 7.86 |
| St. Paul | 6.84 | 7.78 | 8.66 | 7.08 | ... | 6.94 | 8.06 | .... | 7.12 | 6.99 | 8.12 |
| San Francisco | 7.35 | 8.70 | 9.30 | 7.60 | ... | 7.15 | 9.75 | 13.05 | 7.25 | 7.20 | 9.25 |
| Seattle | 8.15 | 9.50 | 9.80 | 8.00 | ... | 7.60 | 10.65 | 13.50 | 7.50 | 7.60 | 9.40 |
| Spokane | 8.15 | 9.40† | 9.80 | 7.60 | .. | 7.60 | 10.55¶ | 14.15 | 7.25 | 7.35 | 9.40 |
| Washington | 6.71 | 7.65 | 8.35 | 7.51 | .... | 7.37 | 8.43 | .... | 7.49 | 7.36 | 8.49 |

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **⅛-in. and heavier, add 0.35c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; ¶—500 to 9999 lb; #—1000 to 1999 lb; ¶—1000 lb and over; †—1500 lb to 3999; §—under ⅛ in.

# Warehouses Expect April Sales Gain

### Order volume in March generally bettered that of preceding month. Further rise is indicated as consumers' stocks decline and seasonal rise in manufacturing develops

**Philadelphia**—While not reflecting the usual improvement noted at this time of year, warehouse steel demand in March was a shade better than during February. Distributors report that business is still on a profitable basis, notwithstanding keen competition which has resulted primarily from the cutting of extras in various cases. Indications still point to some reductions in base prices, especially because of the reduction in railroad freight rates, but no changes have yet been announced.

**Cincinnati**—If March proves a better business volume month than February, it will be because there were more billing days in the month and not due to any substantially increased activity. That appears to be the picture here as distributors look back over their sales.

**Cleveland**—March order volume of warehouses in this district bettered that of February and further gains are anticipated as seasonal influences are felt. Business is not developing like it did in recent years, however, and the separate sellers have to do a lot of digging to bring in an order.

The sluggish demand, naturally, serves to stimulate competition and considerable price shading is reported in the area, especially in the case of imported structurals and bars, and also second sheets. In the case of the latter, it is reported seconds are being offered as much as $30 per ton under prime material.

Recently, a local distributor purchased a substantial tonnage of second sheets from a new mill just getting into production. Offers of this material at substantial concessions temporarily played hob with the warehouse market for prime sheets in the district.

**New York**—Steel warehouses enter second quarter with hopes the construction industry will tilt volume upward. Sales during the first three months this year were substantially below those in the like period last year, at least 35 to 40 per cent on the average. Total volume has been

## STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

| | North Atlantic | South Atlantic | Gulf Coast | West Coast |
|---|---|---|---|---|
| Deformed Bars, Intermediate, ASTM-A-305 | $4.75 | $4.85 | $4.75 | $5.00 |
| Bar Size Angles | 4.39 | 4.49 | 4.39 | 4.67 |
| Structural Angles | 4.39 | 4.49 | 4.39 | 4.67 |
| I-Beams | 4.39 | 4.49 | 4.39 | 4.67 |
| Wide Flange Beams | 4.94 | 5.02 | 4.94 | 5.22 |
| Sheet and Plate, 10 gage, 11 gage, 5' x 10' | 5.87 | 5.95 | 5.87 | 6.25 |
| Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft | 25.00 | 25.70 | 25.50 | 26.34 |
| Barbed Wire | 6.20 | 6.30 | 6.20 | 6.48 |
| Merchant Bars | 4.65 | 4.75 | 4.65 | 4.93 |
| Hot Rolled Bands | 4.65 | 4.75 | 4.65 | 4.93 |
| Wire Rods, Thomas Commercial No. 5 | 4.77 | 4.84 | 4.82 | 5.09 |
| Wire Rods, O-H, Cold Heading Quality No. 5 | 5.23 | 5.30 | 5.28 | 5.55 |
| Channels | 4.49 | 4.59 | 4.49 | 4.77 |
| Bright Common Wire Nails, 8d | 6.55 | 6.65 | 6.60 | 6.85 |

| Size O.D. | Wgt/Foot/Lb | Gulf Port | West Coast | Vancouver |
|---|---|---|---|---|
| Seamless A.P.I. Casing, Grade J-55: | | | | |
| 5½ in. | 15.5 | $1.47/ft | $1.51/ft | $1.32/ft |
| 7 in. | 23 | 2.10/ft | 2.17/ft | 1.90/ft |
| Seamless N-80 Casing: | | | | |
| 5½ in. | 17 | 1.94/ft | 2.00/ft | 1.75/ft |
| 7 in. | 23 | 2.50/ft | 2.70/ft | 2.36/ft |
| Seamless J-55 Tubing: | | | | |
| 2⅜ in. | 4.7 | 0.60/ft | 0.63/ft | 0.55/ft |
| 2⅞ in. | 6.5 | 0.80/ft | 0.83/ft | 0.73/ft |

Sources of shipment: Western continental European (Schuman Plan) countries.

on an even keel since the beginning of this year.

Distributors have little complaint as to the number of orders, but, individually, they are small, adding to the cost of distribution. At the current rate of activity, warehouses are long on inventories of numerous products. They are placing orders with the mills accordingly until their stocks are lower. Prices are not down in line with lower rail freight charges recently put into effect.

**Pittsburgh** — With mills speeding deliveries and filling smaller orders in such products as sheets, bars and tubing, small fabricators are slow to place orders with distributors. As a result a growing number of inquiries is noted but no definite improvement in orders. Distributors say hot-rolled and cold-finished sheet sales are slow. All products, including most sizes of plates and structural shapes, are in good supply.

**Seattle**—Warehouse business is not too brisk. However, volume is fair and prospects are considered favorable. As a rule price schedules are firm in the Seattle area but in overlapping competitive areas, particularly eastern Washington, distributors have to meet cut prices offered by Portland sellers.

**Chicago**—Steel warehouses are still waiting for positive indication of better sales volume ahead. Optimism continues, but orders fluctuate in a manner which defies cataloging them into a pattern capable of positive interpretation.

**San Francisco**—March turned out to be a pretty good month for warehouses. Volume was better than in January and February, and with spring building getting off to a good start, distributors are looking forward to continued good business.

**Los Angeles** — Only wide-flange beams are in tight supply for warehouses. Distributors are keeping a firm rein on inventories as they edge close to 100 per cent of normal. They are optimistic that second quarter will show increased activity.

## Cuts Magnesium Alloy

**Midland, Mich.**—Dow Chemical Co. reduced the price of commercial magnesium die casting alloy, designated as AZ91B, 1 cent per pound to 27.00c, f.o.b. Madison, Ill. This alloy is patterned to the needs of the commercial die casting industry and contains beryllium additions for lower melt loss and increased efficiency.

# Moderate Pickup Developing in Sheets

**Mill bookings still disappointing but mild improvement in sales is noted at various market centers. Cautious buying expected to continue through second quarter**

Sheet and Strip Prices, Pages 167 & 168

**Philadelphia**—Sheet buying shows further mild improvement, especially in cold-rolled material. Galvanized is some better, with air-conditioning demands expanding. Among the specialties, stainless sheets of the nickel-chrome variety also reflect some improvement. High grade electrical sheets are active, but the low grade type is lagging once again, following a little spurt a few weeks ago. Demand for enameling stock is only fair. Incidentally, there is no freight absorption on this material, nor on most specialties.

Department of General Stores, Navy, will receive bids here Apr. 15 on 620 tons of flat nailless coated steel strapping in 50 to 125-pound coils for delivery to east and west coast yards.

Due to the recent reduction in freight rates the delivered price on rail shipments of hot-rolled sheets here is 4.13c on 40,000-pound lots and 4.115c on 80,000-pound quantities. On cold-rolled sheets, the delivered price is 4.98c on 40,000-pound lots and 4.965c on 80,000-pound.

These delivered prices are predicated on 4.025c, Fairless, Pa., on hot-rolled sheets, and 4.875c, Fairless, Pa., on cold-rolled, and on 10.50c and .09c rates on 40,000-pound and 80,000-pound lots, respectively.

Some trade interests believe that this change will not result in too much of a switch from motor truck to rail haulage because of the protective shrouding charge on rail shipments of sheets of 5 cents per 100 pounds. Also, there is talk that the truckers are seeking adjustments in their rates, effective May 15.

**Cleveland**—Some slight improvement is noted in demand for sheet and strip, but the pickup in volume is disappointing, especially since buyers continue to order largely against needs.

Indications are consumers' inventories are shrinking but they still are a factor to contend with. The fact that relatively prompt shipments can be obtained from the mills is seen as a deterrent to buying for inventory.

Base prices continue to hold at the levels established months ago. However, concessions are being made in the way of freight absorption and shading or waiving of certain extras. The recent reduction in railroad freight rates on steel will lower delivered prices on rail shipments around $2 per ton, it is understood.

**Pittsburgh** — Producers report a growing number of inquiries for sheets, but orders remain near last month's level. Warehouse orders are falling off in some districts, improving in others. Sales to appliance producers are expected to increase soon.

Cold-rolled sheet production received an impetus from increased output planned by an automaker. A second bright spot is increased sales of galvanized sheets for farm buildings.

Sheet and strip steel comprised an increased portion of finished steel shipments by Jones & Laughlin Steel Corp. in 1953. In that year, hot-rolled and cold-rolled sheets and strip constituted 37 per cent of the company's shipments, compared with 32 per cent in 1952.

Percentages of other products shipped in 1953 are: Tubular goods, 18; hot-rolled and cold-finished bars, 16; tin mill products, 9; plates and

**Record Breaker**

Republic Steel's Trumbull Cliffs blast furnace at Warren, O., casting iron at dusk. Stack set all-time company output record in '53 with 574,028 tons

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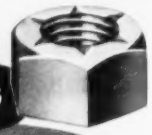

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BIG NEWS!

ON PAGE 123

SAMSON SHOT
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structural shapes, 12; wire products, 5; and miscellaneous 3.

J. & L.'s shipments of finished steel in 1953 set a new record of 4,278,000 net tons, compared with 3,332,000 tons in the preceding year.

**Boston**—With few exceptions, carbon sheet producers who withdrew from this territory when steel was in short supply, now are back in the market, equalizing their prices with those from the Fairless, Pa., or Buffalo mills. Much larger flat-rolled tonnage is available at a time when demand is off. To lesser degree this applies to stainless and specialties, the margin being higher on most specialties.

This return to competitive selling is meat for consumers. They drive as hard bargains as did sellers only a year ago. Contributing to cost-consciousness are lower prices for fabricated products, fluorescent lighting fixtures being typical of many.

April and May bookings of sheets and strip lend slight support to the outlook for any substantial improvement in production during second quarter.

**St. Louis**—Granite City Steel Co., last week doubled its ingot production as semifinished inventories, after a months-long workdown, reached normal level or slightly below. Officials are hopeful orders will justify continuation of higher output.

New orders the first three weeks of March were slightly ahead of the same February period, but dropped off the fourth. February was a trifle better than January. The strongest spot in sheet demand here is galvanized roofing.

**New York**—Sheet buying lags but the trend in orders is slightly upward. It is still too early to predict a definite gain in rollings for April, but indications point to improvement.

Delivered prices here reflect the recent reduction in rail rates. Hot-rolled sheets from Fairless, Pa., the governing base for this market, are now quoted at 4.225c, delivered, for 40,000-pound lots and 4.185c for 80,000-pound lots. Cold-rolled sheets are 5.075c for 40,000-pound lots and 5.035c for 80,000-pound lots.

**Chicago**—Except for two large automakers operating at top rates, specifying of sheets for automotive account is colorless. From orders which that industry is placing there is no sure clue of higher car output during the next 60 to 90 days. Farm equipment buying is steady and there is stronger activity for appliances.

## Steel Bars . . .

Bar Prices, Page 166

**Boston**—Most bar volume booked is predicated on delivery. Consumers want the lowest price available at the best delivery possible, and they are getting tonnage on this basis, both carbon and alloy. Hot-rolled bar demand from converters is slow and cold-finishing operations are off.

**Cleveland**—Some slight quickening in demand for commercial steel bars is reported by several sellers, but volume continues disappointing. Liquidation of consumer inventories still is a factor, though requests for prompt shipment are being received in increasing number, indicating that some users reduced their stocks too much.

Added to availability of bars are stocks offered by consumers with defense contracts halted or cut back. Some chain bar tonnage is included. However, one shell contract, 155 millimeter, apparently is going ahead, to reach capacity by May. This will take an estimated 12 carloads of billets daily. This is the New Bedford Defense Products plant, New Bedford, Mass. Saco-Lowell shops, Biddeford, Me., with new machine gun contracts, will need tonnage.

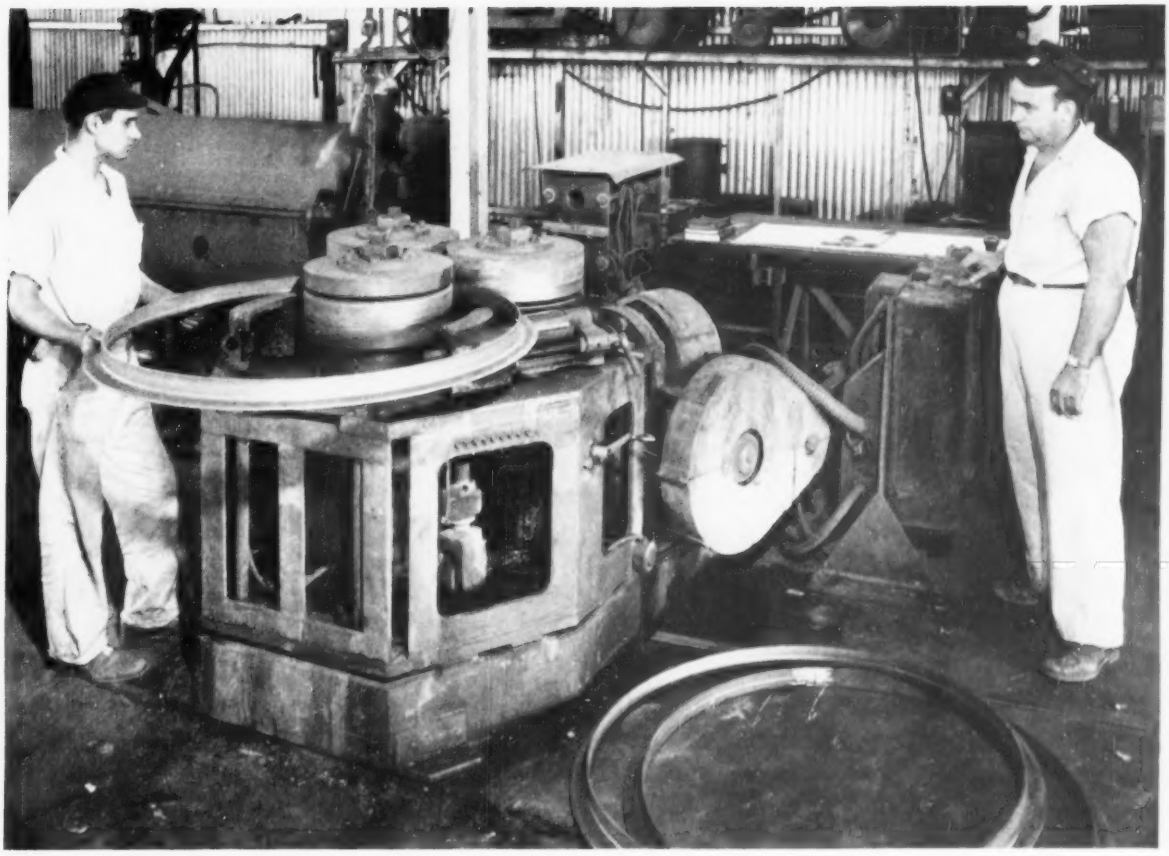
**New York**—Bar orders are increasing slowly. Most requests are for quick shipment. Producers can make quick delivery, usually within a week to 10 days on most items. As yet there have been no indications of any material extension of deliveries.

Delivered prices are down slightly, reflecting the recent decline in rail freight rates. Hot carbon bars from Fairless, Pa., the governing base, are now 4.50c delivered for 40,000-pound lots and 4.46c for 80,000.

**Philadelphia**—Hot-rolled carbon bar business shows further slight gain with indications April mill operations will top those in March. Reduced rates on rail shipments bring the delivered price here to 4.405c on 40,000-pound lots, and 4.39c on 80,000-pound lots, predicated on a base of 4.30c, Fairless, Pa.

**Pittsburgh**—Seasonal gains are slight, reflected in gradually increasing sales to farm equipment manufacturers. Distributors, who have done little purchasing recently, are now filling holes in inventories. Full scale ordering will probably not begin for several months.

**Los Angeles**—Although fabricators' bar requirements are slightly firmer supplies are abundant. Cold-drawers are operating at 35 to 45 per cent of capacity.



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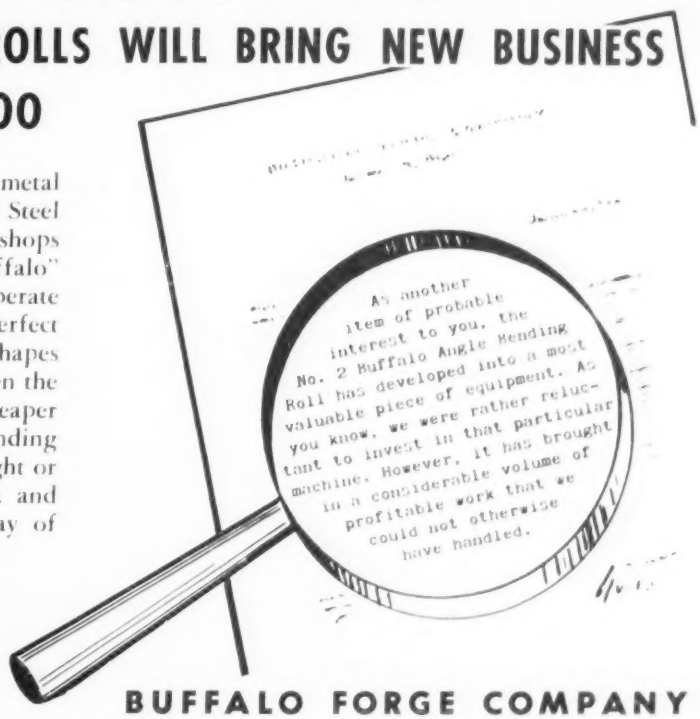
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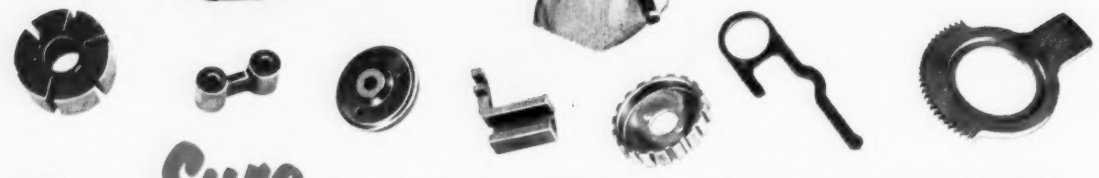

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## Plates . . .

Plate Prices, Page 166

**Philadelphia** — Plate business is edging upward, but it is still spotty and not in keeping with the usual seasonal improvement experienced at this time of year.

Lack of ship and railroad work continues to be seriously felt, and while most tank and boiler shops are doing a little better, they are buying on a hand-to-mouth basis, in some cases not even doing that, still drawing on inventories. However, stocks are low in various instances, indicated by the increasing number of requests for quick deliveries.

The local delivered price on plates reflects the recent reduction in railroad freight rates. Governing bases for Philadelphia are Claymont, Del., and Conshohocken, Pa., each with the same rate of .08 cents per pound, before tax, on 40,000 pound carlots. Plates do not take the 80,000-pound rate. Hence, with the base price 4.10c mill, the same as at other eastern producing points, the delivered price here is 4.18c.

Lukens Steel Co., Coatesville, Pa., will take bids Apr. 22 on 2000 tons of structural steel for additional Navy armor plate capacity at its plant.

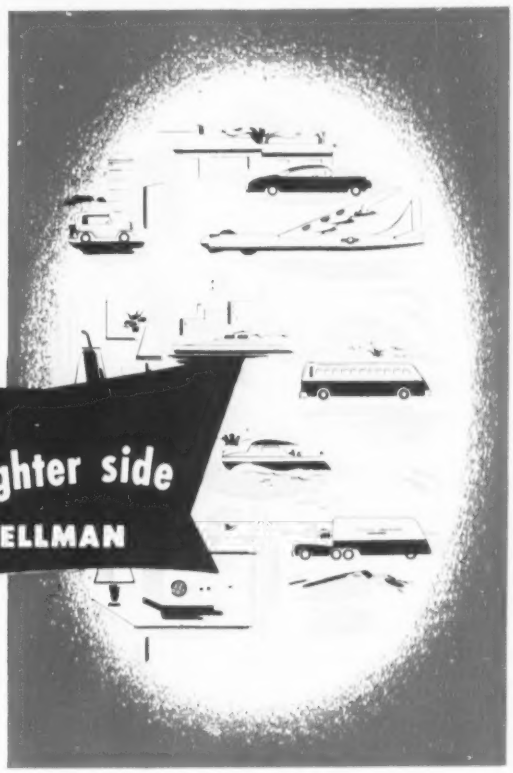
**Boston**—Fabricating shops are buying only what is needed to maintain operations. Orders are for prompt delivery and where inventories are down no attempt is made to build up stocks. April bookings are only slightly ahead of March and consumption is heavier only in spots, such as tanks and paper mill equipment.

Before buying more plate users ask for prices and formal quotations, notably if specifications include semi-fabricated work, flanged, sheared or cut to shape and weldments.

While price competition rules in most products, there is no freight absorption yet on plates. Carbon plates, delivered Boston from Conshohocken, Pa., 40,000 pounds, are 4.54c; Sparrows Point, 4.65c; Pittsburgh, 4.83c, the latter equalizing with absorption of $5 per ton.

**New York**—Plate demand shows little variation. Business is dull, but it is getting no worse. Delivered prices here reflect the recent reduction in rail freight rates. With Conshohocken, Pa., the governing base for this market, the delivered price on 40,000-pound lots is now 4.34c. Plates do not take the 80,000-pound rate.

**Pittsburgh** — Freight car builders and warehouses have trimmed plate

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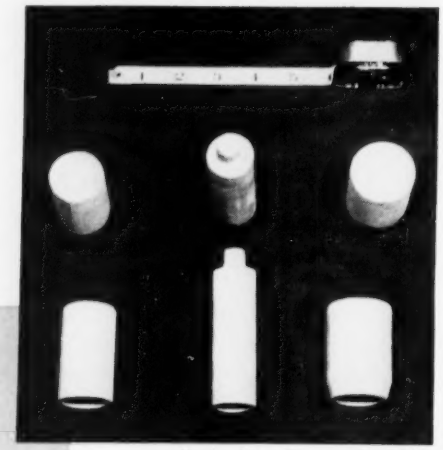

Carburizing Fixture for Ball Bearings 1½" diameter—Analysis 35% Ni — 15% Cr

DURALOY

# Large

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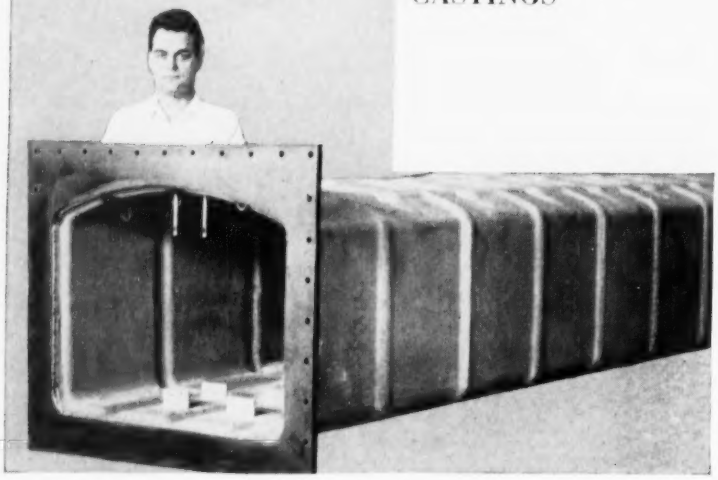

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purchases. Their stocks are sufficient for present needs. Activity in heavy construction is slack, but road-building requires large supplies. Levelling of inventories occupies attention of light construction companies.

**Los Angeles**—Plate producers' order books are open for April. Currently tight, plate supplies are expected to improve in second quarter.

## Wire . . .

Wire Prices, Page 168

**Boston** — Slight improvement in bookings is maintained, but April wire production schedules are far from filled on most products. Orders are mostly for prompt shipment, and, while some volume for May has been taken, consumers hold inventories to immediate needs where they have been reduced to the level desired.

To meet requirements for new orders, users frequently have to cover on wire for prompt delivery. This procurement policy is not expected to change soon with manufacturers wire available in two to three weeks.

Leading producer will not close for vacation this summer. Vacations will be staggered and production maintained.

## Tubular Goods . . .

Tubular Goods Prices, Page 169

**Pittsburgh**—Oil country goods sales continue strong, but demand for drill pipe is declining. Seamless tubing is growing more competitive. Producers report a substantial volume of inquiries, with quick service required. Sales to warehouses, slow for several months, are improving. Specialty tubing sales are slow, as are sales to farm equipment producers. At the same time inquiries are growing for mechanical tubing.

**Boston**—Competition for steel pipe volume is intensified by resumption of sales by Bethlehem Steel Co. in this territory to distributors and direct shipments. This producer withdrew from the New England area several years ago, except most Connecticut points, including Hartford.

Fairless, Pa., has a railroad freight advantage of $2.40 per ton over nearest competitor. All tonnage is equalized through freight absorption, but amount absorbed also involves variances in mill base prices.

Seasonal improvement in sales with distributors is slow. Their demand on mills barely maintains stocks. Increase in activity has been mostly in direct shipments of seamless, lapweld.

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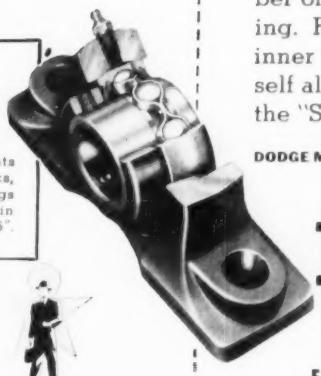
Precision built bearing for small shafts and moderate loads. Pillow blocks, flange bearings and hanger bearings available from distributors' stocks in shaft sizes ranging from 3/4" to 2-7/16".



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TORONTO, CANADA
MONTREAL, CANADA


## Tin Plate . . .

Tin Plate Prices, Page 168

**Washington**—Shipments of metal cans in January amounted to 264,708 tons, up about 38 per cent from the December total of 192,403 tons. The January total also compares with a revised figure of 269,717 tons in January, 1943.

Food cans amounted to 161,320 tons, against 123,416 in December and 167,764 in the corresponding period a year ago. Non-food cans totaled 103,388 tons, against 68,987 and 101,953 tons.

**Pittsburgh**—The mills hold sizable stocks of tin plate, but these are gradually being worked down with shipments greater than production. Outlook is for April sales to be near the March level.

## Pig Iron . . .

Pig Iron Prices, Page 170

**New York**—Production of pig iron, ferromanganese and spiegeleisen in blast furnaces during February was off from the preceding month and from output in February a year ago, reports the American Iron & Steel Institute.

Output for the month totaled 4,810,554 net tons, comparing with 5,579,513 in January and with 5,881,518 in February, 1953.

Of the total output in February, 4,764,613 tons were pig iron and 45,941 ferromanganese and spiegeleisen. In January 5,515,689 tons of pig iron were produced, and 63,824 tons of ferromanganese and spiegeleisen. In February, 1953, output of pig iron was 5,813,202 tons and ferroalloys, 68,316 tons.

Production by districts during February follows:

BLAST FURNACE PRODUCTION
February 1954
(Net Tons)

| District | Pig Iron | Ferro-manganese & Spiegel | Total |
|---|---|---|---|
| Eastern | 1,055,526 | 18,252 | 1,073,778 |
| Pittsburgh-Youngstown | 1,608,339 | 19,321 | 1,627,660 |
| Cleveland-Detroit | 442,654 | ..... | 442,654 |
| Chicago | 1,037,188 | ..... | 1,037,188 |
| Southern | 409,410 | 8,368 | 417,778 |
| Western | 211,496 | ..... | 211,496 |
| Total for month | 4,764,613 | 45,941 | 4,810,554 |

**New York**—Pig iron sellers note little change in demand. Gray iron shops continue to operate on a restricted basis of 3 to 4 days a week, and in most cases are still drawing on inventories for current needs. However, there are exceptions.

**Boston**—Pig iron price for second

(*Please turn to page* 185)

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# CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

## MANGANESE ALLOYS

**Spiegeleisen:** (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

**Standard Ferromanganese:** (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

**Manganese metal,** 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c, ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

**Electromanganese:** Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

**Silicomanganese:** (Mn 65-86%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

**Ferrotitanium, Medium-Carbon:** (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

**Foundry Ferrochrome, High-Carbon:** (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25% per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

**Foundry Ferrochrome, Low-Carbon:** (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

**Low-Carbon Ferrochrome Silicon:** (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

**Chromium Metal:** (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

## VANADIUM ALLOYS

**Ferrovanadium:** Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

**Grainal:** Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

**Vanadium Oxide:** Contract, less carload lots $1.28 per lb contained $V_2O_5$, freight allowed. Spot, add 5c.

## SILICON ALLOYS

**25-30% Ferrosilicon:** Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

**50% Ferrosilicon:** Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c Delivered. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

**65% Ferrosilicon:** Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot add 0.35c.

**75% Ferrosilicon:** Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c Delivered. Spot, add 0.8c.

**90-95% Ferrosilicon:** Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

**Silicon Metal:** (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

**Ferroboron:** (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 P or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 1 to 2%) contact, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 8.2c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 6.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

**Molybdic-Oxide Briquets:** (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (70-80%), 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

**Ferrotantalum—Columbium:** (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

**Simanal:** (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c, Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

**Ferrophosphorus:** (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

**Technical Molybdic-Oxide:** Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13. f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

CARBON DETERMINATION

# Alloymet 2115

**A product of close Metallurgical CONTROL for the production of stainless steel and alloyed iron**

**From the original formula to the ingot, control is the most important item in our book. *Alloymet* 2115 and its companion alloys are products pre-alloyed to take the "headache" out of the melting department. A single trial in your mill will make you an *Alloymet* "regular."**

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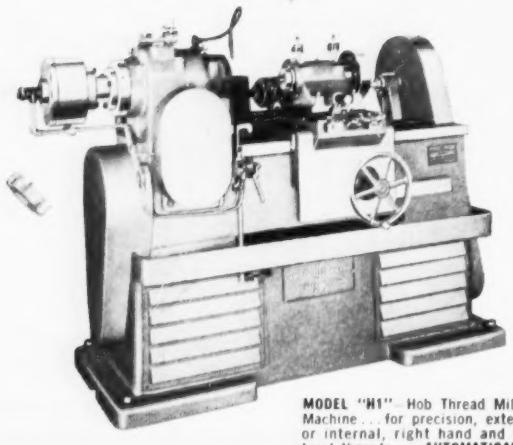
**uninterrupted accuracy**



**MODEL "H1"**—Hob Thread Milling Machine . . . for precision, external or internal, right hand and left hand threads . . . **AUTOMATICALLY!**

*when threaded on*

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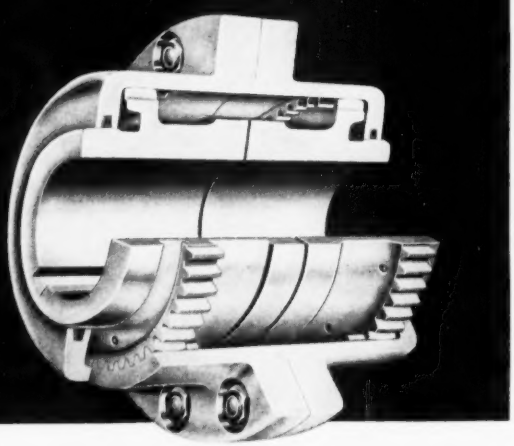
*Without obligation, consult our engineering staff with your specific threading problems. Catalog and machine specifications available upon request.*

MACHINE TOOL BUILDERS SINCE 1896

The James Coulter Machine Co.

631 Railroad Ave. Bridgeport 5, Conn.

# POOLE

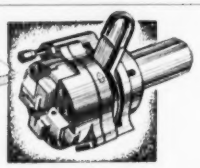


A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST

# FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

H&G Insert Chaser DIE HEADS



**famous** for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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*To lower your Overhead..*

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

**PERFORMATED METALS**
TO YOUR REQUIREMENTS
FOR
**ALL INDUSTRIAL USES**
**ARCHITECTURAL GRILLES**
SEND FOR CATALOG NO. 39
**DIAMOND MFG. CO.**
BOX 32 WYOMING, PA.

(*Concluded from page 180*)

quarter, is $1.75 per ton lower, f.o.b. Everett furnace, or $61.25, No. 2 foundry, plus usual differentials for silicon, phosphorus and manganese. This price is based on February costs, the only month during three-month period that Mystic furnace cast 13,000 tons, establishing a price for the quarter under contract agreement with most district consumers.

Demand for iron is a shade heavier. Textile equipment builders operate at low rate, but one has taken in slightly more tonnage. While most shops operate four days per week, some are not pouring at capacity during that period.

**Philadelphia** — Fairly substantial buying of German foundry pig iron by a district consumer is reported at the equivalent of $47 on cars here, duty paid. This price is at least $12 or so below the domestic market. Sales of domestic iron show little change in general, although one producer reports that March shipments were a shade better on a daily basis.

**Cleveland** — Seasonal pickup in foundry operations is anticipated but so far it is not reflected in any marked improvement in pig iron demand. The furnaces are moving tonnage steadily, but they are not under pressure for shipments. Foundries are ordering against needs, and with quick shipments available are disinclined to buy for inventory.

**Seattle**—Foundry operations in this district are described as seasonally fair. Both pig iron and scrap are in plentiful supply. Foreign pig iron is quoted here about $10 per ton under domestic material. One local plant has 250 tons of iron enroute from South Africa.

## Reinforcing Bars . . .

**Reinforcing Bar Prices, Page 166**

**Seattle**—While prospects are promising for reinforcing bar business, no large awards have been made recently. Mills report a substantial number of small orders with the result backlogs are static. Operations are unchanged.

## Metallurgical Coke . . .

**Metallurgical Coke Prices, Page 185**

**Birmingham**—Installation of a new facility for recovery of coal chemicals from crude tar is announced by the Tennessee Coal & Iron Division, U. S. Steel Corp. Construction has been completed on the plant at Fairfield, Ala., and it will be in full operation shortly. Products will include naphthalene, creosote oil, solvent naphtha and pitch.

# ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

## ORES

**Lake Superior Iron Ore**

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

| | |
|---|---|
| Old range bessemer | $10.30 |
| Old range nonbessemer | 10.15 |
| Mesabi bessemer | 10.05 |
| Mesabi nonbessemer | 9.90 |
| Open-hearth lump | 11.15 |
| High phosphorus | 9.90 |

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

**Eastern Local Iron Ore**

Cents per unit, deld. E. Pa.

| | |
|---|---|
| Foundry and basic 56-62% concentrates contract | 17.00-18.00 |

**Foreign Iron Ore**

Cents per unit, c.i.f. Atlantic ports

| | |
|---|---|
| Swedish basic, 60 to 68% | 22.00 |
| North African hematite (spot) | 20.00-22.00 |
| Brazilian iron ore, 68-69% (spot) | 25.00 |

**Tungsten Ore**

Net ton unit, before duty

| | |
|---|---|
| Foreign Wolframite min. 60%, $WO_3$ | 23.80 |
| Domestic scheelite, mine | 63.00 |

**Manganese Ore**

Mn 48%, nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05-$1.07.

**Chrome Ore**

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

*Indian and African*

| | |
|---|---|
| 48% 2.8:1 | $40.00-$42.00 |
| 48% 3:1 | 44.00-46.00 |
| 48% no ratio | 32.00-34.00 |

*South African Transvaal*

| | |
|---|---|
| 44% no ratio | $24.00-$26.00 |
| 48% no ratio | 34.00 |

*Domestic*

(Rail nearest seller)

| | |
|---|---|
| 48% 3:1 | $39.00 |

**Molybdenum**

| | |
|---|---|
| Sulphide concentrate, per lb. Mb content mines, unpacked | $1.00 |

**Antimony Ore**

Per unit of Sb content, c.i.f. seaboard

| | |
|---|---|
| 50-60% | $2.40-$2.80 |
| 65% min. | $3.40-$3.50 |

**Vanadium Ore**

Cents per lb. $V_2O_5$ content, deld. mills

| | |
|---|---|
| Domestic | 31.00 |

## REFRACTORIES

**Fire Clay Brick**

*High-Heat Duty:* Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

**Silica Brick**

*Standard:* Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

**Insulating Fire Brick**

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

**Ladle Brick**

*Dry Pressed:* Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

**Sleeves**

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

**Nozzles**

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70

**Runners**

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

**High-Alumina Brick**

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

**Dolomite**

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

**Magnesite**

Domestic, deadburned bulk; Luning, Nev., $38.

## METALLURGICAL COKE

Price per net ton

**Beehive Ovens**

| | |
|---|---|
| Connellsville, furnace | $14.50-$15.00 |
| Connellsville, foundry | 16.50-17.00 |

**Oven Foundry Coke**

| | |
|---|---|
| Kearney, N. J., ovens | $24.00 |
| Everett, Mass., ovens | |
| New England, deld. | *26.00 |
| Chicago, ovens | 24.50 |
| Chicago, deld. | 26.00 |
| Terre Haute, ovens | 24.05 |
| Milwaukee, ovens | 25.25 |
| Indianapolis, ovens | 24.25 |
| Chicago, deld. | 28.12 |
| Cincinnati, deld. | 25.85 |
| Painesville, O., ovens | 25.50 |
| Cleveland, deld. | 27.43 |
| Erie, Pa., ovens | 25.00 |
| Birmingham, ovens | 22.65 |
| Cincinnati, deld. | 27.58 |
| Lone Star, Tex., ovens | 18.50 |
| Philadelphia, ovens | 23.95 |
| Swedeland, Pa., ovens | 23.85 |
| St. Louis, ovens | |
| St. Louis deld. | 26.00 |
| St. Paul, ovens | 23.75 |
| Portsmouth, O., ovens | 24.00 |
| Cincinnati, deld. | 26.62 |
| Detroit, ovens | 25.50 |
| Detroit, deld. | 26.50 |
| Buffalo, deld. | 28.08 |
| Flint, deld. | 28.23 |
| Pontiac, deld. | 27.06 |
| Saginaw, deld. | 28.58 |

*Or within $4.55 freight zone from works.

## COAL CHEMICALS

Spot, cents per gallon, ovens

| | |
|---|---|
| Pure benzol | 40.00 |
| Toluol, one deg. | 32.00-35.00 |
| Industrial xylol | 32.00-35.00 |

Per ton, bulk, ovens

| | |
|---|---|
| Sulphate of ammonia | $44-$47 |
| Birmingham area | 45.00† |

†With port equalization against imports.

Cents per pound, producing point

| | |
|---|---|
| Phenol, 40 deg. (U.S.P.), tank cars | 18.00 |
| c.l. drums | 19.00 |
| l.c.l. drums | 19.50 |

## FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective $CaF_2$ content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

## ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

**GRAPHITE**

| Inches Diam | Length | Per 100 lb |
|---|---|---|
| 2 | 24 | $43.50 |
| 2½ | 30 | 28.00 |
| 3 | 40 | 27.25 |
| 4 | 40 | 26.00 |
| 5½ | 40 | 25.75 |
| 6 | 60 | 23.25 |
| 7, 8, 9, 10 | 60 | 21.00 |
| 12, 14 | 72 | 20.50 |
| 16 | 72 | 20.00 |
| 17 | 60 | 20.50 |
| 18 | 72 | 20.50 |
| 20 | 72 | 20.00 |

**CARBON**

| | | |
|---|---|---|
| 40 | 100 | $8.95 |
| 40, 35, 30 | 110 | 8.95 |
| 30 | 84 | 9.10 |
| 24 | 96 | 8.90 |
| 24 | 72, 84 | 9.10 |
| 20 | 90 | 8.95 |
| 20 | 84 | 9.10 |
| 17 | 72 | 9.10 |
| 17 | 60 | 9.50 |
| 14 | 72 | 9.50 |
| 14, 12, 10 | 60 | 10.30 |
| 8 | 60 | 10.55 |

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STAINLESS-CLAD STEEL

**Heat-Resisting Steel**
of Exceptional Forming Qualities

**Solid Stainless Steel**
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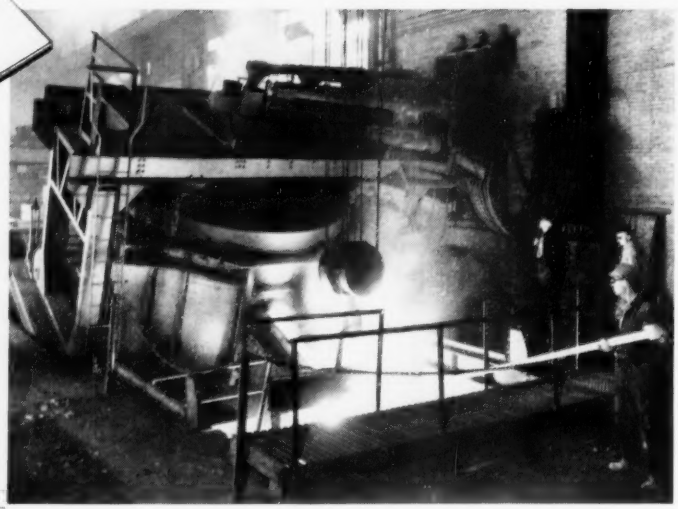

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**STEEL DIVISION** *Borg-Warner Corporation*

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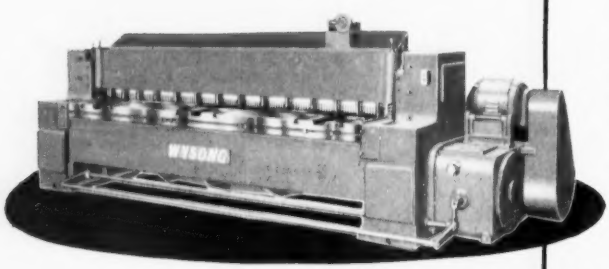


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**WYSONG**

Wysong and Miles Company, Greensboro, N. C.

## Semifinished Steel . . .

Semifinished Prices, Page 166

**Youngstown** The district steel ingot operating rate last week went back up to 70 per cent of capacity, with two bessemer plants, 47 open hearths and 14 blast furnaces in operation. Youngstown Sheet & Tube Co.'s Campbell Works and Republic Steel Corp.'s Youngstown Works each added two open-hearth furnaces to the active list to take care of additional business.

**Los Angeles** Pacific States Steel Corp.'s 28-inch bar mill is rolling again after being down for repairs.

## Canada . . .

**Montreal, Que.** Reductions in railway freight rates on movement of Canadian steel to British Columbia are under consideration. Conferences have been held between steel producers and the railroads but definitive agreements have not yet been reached. Object of the reductions is to make steel produced in eastern Canada on a competitive basis with imported steel on the West Coast. It is also understood the steel companies plan to increase their freight allowance on shipments. Commenting on this latter, H. G. Hilton, president, Steel Co. of Canada, declined to confirm the report, but pointed out that freight absorption is a factor in the markets.

## Structural Shapes . . .

Structural Shape Prices, Page 166

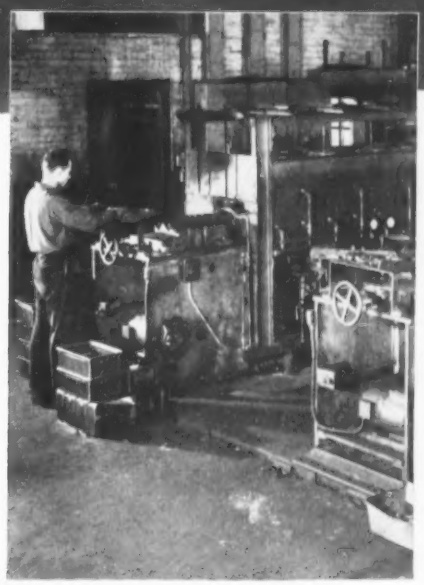
**Boston** Structural steel is one of the few products on which freight is not being absorbed. Under new freight rates, fabricating shops get plain material up to $2.88 per ton lower, Pittsburgh, slightly less saving from Bethlehem and Buffalo.

**New York** Reflecting primarily activity in small miscellaneous work, structural awards are heavier. Still further gain is anticipated as more inquiry is developing. Several fairly sizable bridge jobs are coming out for the state of New York with bids closing Apr. 22.

**Philadelphia** Structural steel demand is perking up a bit. One outstanding award involves 3750 tons of state bridge work in Philadelphia and Montgomery counties, the steel having been pending since last July, and another 1600 tons for a shed for the municipal marine terminal, Wilmington, Del. A leading inquiry calls for 2000 tons for an armor plate plant at Coastesville, Pa.

The recent reduction in rail freight rates does not affect shapes as trucks form little competition in the


For DEPENDABILITY



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**INTERCHANGEABLE**
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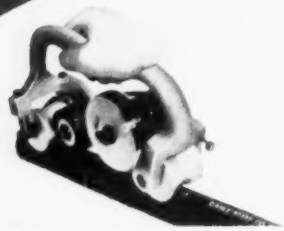
**MARKING**
**MATTHEWS PORTABLE PRINTER**



Reduce marking costs. Use this portable unit to print flat sheets, curved plates, hose, tubes, even-sided bars, etc.

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Completely equipped ready for operation. The 1.5 Cu. Ft. model as shown handles parts or assembled units up to 23" long, 12½" deep x 9" high and the 6.5 Cu. Ft. model up to 47" lengths, 16" deep x 15" high. Revco Sub-Zero Chests meet highest performance standards featuring temperatures of 95° and 85° below zero while running continuously in normal room temperatures. Other controlled low-temperatures readily attained.

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*Fifth Edition, 440 pages, Illustrated,*

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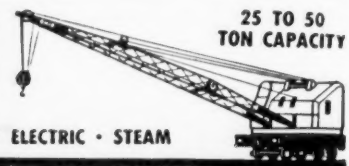
WE FEATURE SPECIAL PUNCHES & DIES
**660 E. 82nd ST., CLEVELAND, O.**

**OHIO LOCOMOTIVE CRANES**



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**WHEELING STEEL CORPORATION**
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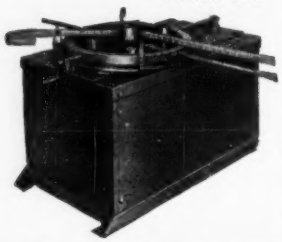
**WHEELING**
**SOFTITE**
**GALVANIZED SHEETS**
DUCTILE, TIGHT-COATED — IN GAUGES NO. 18 TO 30

**KARDONG FOUR-WAY BENDER**
For Concrete Reinforcing Bars

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

**KARDONG BROTHERS, INC.**
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movement of this product.

February bookings amounted to 267,310 tons, the highest figure since last May, reports the American Institute of Steel Construction. Bookings in the first two months of the year amount to 445,002 tons, which is a little short of the total for the corresponding period of 1953.

February shipments of 251,981 tons are up 4 per cent from the revised total of 242,419 tons for January and bring shipments for the first two months of the year to 494,400 tons. This is a little ahead of shipments in the like period of last year.

Order backlogs at the end of February totaled 1,697,313 tons, comparing with 2,128,389 tons at the end of February a year ago.

**Cleveland**—Substantial volume of structural work is out in this district and the usual seasonal pickup is anticipated as spring advances. Not only is considerable public work in progress or projected, but a surprising number of small industrial and commercial projects are reported.

Competition for going work is extremely keen, however, and this is reflected in shading of prices. Imported beams and bars from Europe figure prominently in current estimating in this district. European broad beams, somewhat comparable to so-called domestic wide flange beams, are reported to have been purchased by fabricators here at $92.40 a gross ton.

**Seattle**—Bethlehem Pacific Coast Steel Corp. has been awarded 2300 tons of tower steel for the Bonneville Power Administration. Bids opened at Portland, Oreg. Feb. 18.

The successful bid, $829,236 delivery Seattle, compares with $918,285 by American Ligurian Co. Inc., New York, fabricated Bremen, Germany. The foreign firm's base bid was $809,756, but transportation, duty and 25 per cent differential brought the total to the higher figure. This order will be fabricated at Bethlehem's Seattle plant.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

3750 tons, bridges in Philadelphia and Montgomery counties, Pennsylvania State Highway & Bridge Authority, through general contractor to Ingalls Iron Works, Verona, Pa., steel for this work has been pending since last July.

2300 tons, tower steel, to Bethlehem Pacific Coast Steel Corp., Seattle, low $829,236, by Bonneville Power Administration.

1600 tons, shed, municipal marine terminal, Wilmington, Del., to Delaware Steel Fabricating Corp., that city.

300 tons, municipal power plant, Vineland, N. J., to Cantley & Co., Philadelphia.

260 tons, offices, warehouse, garage, PUD No. 1, Everett, Wash., to Leckenby Structural Steel Co., Seattle; general contract to

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With long experience in the field of air and gas handling for industrial purposes, Sutorbilt can accurately design and build the unit to fit your particular specifications.
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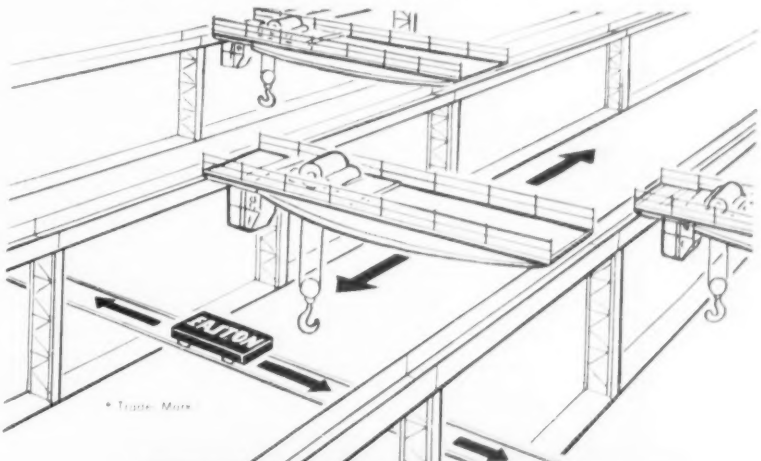
Automatic motor-driven transfer cars provide a universal handling system in modern parallel bay plants now served by overhead cranes. Also for transfer between plant buildings.

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A-1041

EASTON CAR & CONSTRUCTION COMPANY - EASTON, PA. - NEW YORK - PHILADELPHIA - PITTSBURGH

Newland Construction Co., Everett, $472,419.

205 tons, state highway bridge, Fitchburg, Mass.; to Groisser & Shlager Iron Works, Somerville, Mass.

160 tons, readiness hangar, McChord Field, Washington state; to Bethlehem Pacific Coast Steel Corp., Seattle; John H. Selen Construction Co., Seattle, general contractor, low, $295,921.

130 tons, office addition, Textile Machinery Corp., Wyomissing, Pa.; to Reading Steel Products Co., Reading, Pa.

120 tons, Interstate Iron & Supply Co., Philadelphia, to Cantley & Co., that city.

100 tons, including Briarcrest School and miscellaneous, to Leckenby Structural Steel Co., Seattle.

Unstated, four bridges Denali highway, Alaska; Badraun-Flecksing Co., Seattle, low, $298,144, to Alaska Road Commission; steel government furnished.

Unstated tonnage, 2750 sq ft steel grid flooring, 4-span plate girder bridge, Manchester, N. H., to Reliance Steel Products Co., Mc-Keesport, Pa.; Marinucci Bros. & Co., Boston, general contractors; 800 tons, fabricated structural steel, Bethlehem Steel Co., Bethlehem, Pa.

### STRUCTURAL STEEL PENDING

7000 tons, Major Deegan expressway, contract No. 2, Bronx county, New York, bids Apr. 22.

2000 tons, Navy armor plate plant, Lukens Steel Co., Coatesville, Pa., bids Apr. 22.

992 tons, state bridge work, Allegheny county, Pennsylvania, bids Apr. 15; originally advertised as State Highway & Bridge Authority and Federal Aid; it now becomes a regular federal aid project and the State Highway & Bridge Authority is not involved.

938 tons, approaches and connections to new Delaware river bridge, Camden county, N. J., bids to be closed Apr. 27, by the New Jersey State Highway Department, Trenton; also required are 468 tons of reinforcing steel and 2000 linear feet of metal rail.

665 tons, section of Queens Midtown expressway, Triborough Bridge & Tunnel Authority, New York, bids shortly.

622 tons, state bridge work, Westmoreland county, Pennsylvania, bids Apr. 19.

600 tons, garage, Eglin Inc., Nineteenth and Ludlow streets, Philadelphia, bids asked.

470 tons, addition to Washington Athletic Club, Seattle; bids in.

350 tons, National Guard armory, Springfield, O., bids Apr. 8.

342 tons, state bridge, Stroudsburg, Pa., bids Apr. 15.

200 tons, shopping center, Norristown, Pa., bids closed Mar. 30.

152 tons, state bridge work, Adams county, Pennsylvania, bids Apr. 15.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

800 tons, building, Sears Roebuck & Co., Philadelphia, to Concrete Steel Co., that city.

135 tons, Arctic Aeromedical Laboratory, Ladd Air Field, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Kincaid & King Construction Co., Anchorage, Alaska, general contract, low $740,000.

115 tons, state highway bridge, Dennis-Yarmouth, Mass., to Plantations Steel Co., Providence, R. I.; Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor; Bethlehem Steel Co., 85 tons, structural steel.

100 tons, including 58 tons for PUD building, Everett, Wash., and miscellaneous, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, miscellaneous Washington state highway projects, to Northwest Steel Rolling Mills Inc., Seattle.

### REINFORCING BARS PENDING

800 tons, branch store, Gimbel Bros., Charlotte, Pa., pending.

Unstated, sizable tonnage for Park City apartments, Delaware Township, N. J., bids asked.

Unstated, 160-ft Idaho state bridge, Washington county; bids to Boise, Idaho, Apr. 13.

Unstated, North Town shopping center, Spokane, Wash.; bids to Western Realty & Holding Co., Apr. 9.

Unstated, Bureau of Public Roads bridge, Douglas county, Oregon; C. J. Eldon, Portland, Oreg., low $55,424.

Unstated, dormitories, mess buildings, etc., Ladd Air Field, Alaska; Grove, Shepherd, Wilson & Kruge, Seattle, low $4,196,083.

## PLATES . . .

### PLATES PLACED

500 tons, storage spheres for anhydrous ammonia, 2700-ton capacity at Willbridge terminal, Portland, Oreg., and 5000-ton capacity at Pasco, Wash., to Chicago Bridge & Iron Co., Seattle, by Shell Oil Co., San Francisco.

100 tons, 200,000-gal standpipe, Newfields, N. H., to Chicago Bridge & Iron Co., Chicago.

### PLATES PENDING

100 tons, storage tanks, Hanford Works, Washington state; general contract to W. E. Caldwell Co., Louisville, Ky., low $77,690.

Unstated, 200,000-gal. water tank, or wood alternative; bids to Clarence Ricketts, 927 S. W. 152nd St., N. Seattle, Apr. 2 for King County Water District No. 49.

## PIPE . . .

### CAST IRON PIPE PENDING

180 tons, 8 and 6-inch, system expansion; bids to Corvallis, Oreg., Apr. 2.

100 tons or more, 10 and 8-inch, also 300,000-gal reinforcing concrete reservoir; bids to Clara Jessup, Clerk, Omak, Wash., Apr. 14.

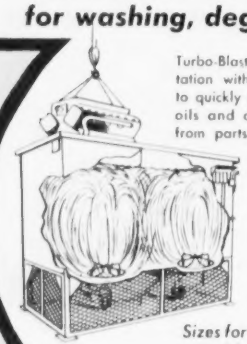
100 tons, 8 and 4-inch; bids to A. M. Quane, controller, Lewiston, Idaho, Mar. 29.

## RAILS, CARS . . .

### LOCOMOTIVES PLACED

Central Railroad of New Jersey, seven 2400-hp diesel locomotives, to Fairbanks, Morse & Co., Chicago.


NEW! TURBO BLAST
CLEANING MACHINES
for washing, degreasing, stripping



Turbo-Blast combines violent agitation with solution detergency to quickly remove chips, cutting oils and drawing compounds from parts in production. Also cleans grease, oil, carbon and deposits from parts and assemblies being serviced. Saves up to TWO-THIRDS in cleaning time. Saves on chemicals — plant space and labor. Heated with steam, fuel oil, natural or manufactured gas with thermostat control for efficiency and economy. Performance facts available.

*Sizes for all requirements from small portable units to specially designed systems of any size, conveyorized or batch types.*

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for *fast* delivery of clean, top-quality tapping and machine screws . . . MADE RIGHT!

*Send for prices now.*

Seaboard SCREW CORPORATION
Plant at W. Warwick, Rhode Island
BRASS, STEEL, AND STAINLESS

# Steelmaking Scrap Prices Holding

**Firmer tone evident in market for third consecutive week despite continued absence of large mill buying. Traders watch steel operations for clew to market trend**

Scrap Prices, Page 192

**Philadelphia** — Open-hearth steel scrap prices are unchanged for the third consecutive week, and sentiment in the market is a trifle better. However, buying is virtually nil and there are no indications of higher prices in the immediate future. District steel operations still lag, and in the case of all mills stocks are substantial.

Lack of price change also applies to other grades of scrap, including low phos, structurals and plate, borings and turnings, railroad specialties and the cast iron items. Actually, the latter have been steady for considerable time, with more strength in this material than in the steel grades.

**Pittsburgh** — Prices are growing steadier. Machine shop turnings and mixed borings and turnings have been increased $1 to $13 to $14. Orders are slowly rising for better scrap grades, but the market in other grades remains dull. Mill inventories are still high.

**New York** — Scrap brokers' buying prices continue unchanged on the major tonnage items and in borings and turnings prices are purely nominal. No. 1 cupola cast is moving in fair quantities at $29 to $30. In stainless, 18-8 borings and turnings are off nominally to $70 to $75. Some trading is noted in 18-8 sheets, clips and solids, with brokers' prices steady at $160 to $165. Prices on straight chrome items are nominally unchanged.

**Detroit** — Observers here this week believe that the open-hearth grades of scrap may have turned the corner. Several sales are reported, mostly for out-of-town clients, with indications that some of the softness may be taken out of the market locally. Until the sales are analyzed it is inaccurate to indicate a general price rise, but the feeling prevails that the next week will see some price increases for the first time in months.

**Buffalo** — Although the steel mills are maintaining a sideline position in the market a stronger feeling is prevalent among scrap dealers here. Demand for steelmaking and blast furnace grades continues to lag but cast iron grades have advanced another $1 per ton on brisk buying of No. 1 cupola by both local and Canadian interests. Cast grades now are reported scarce. An unexpected heavy snowfall here retarded yard activities.

**Boston** — Steel scrap prices appear to have hit bottom with signs of at least mild recovery. Higher prices are not likely to be predicated on district buying. Substantial stocks and below-average consumption operates against recovery. Yard stocks are large and dealers are taking in little tonnage. Cast grades are steadier.

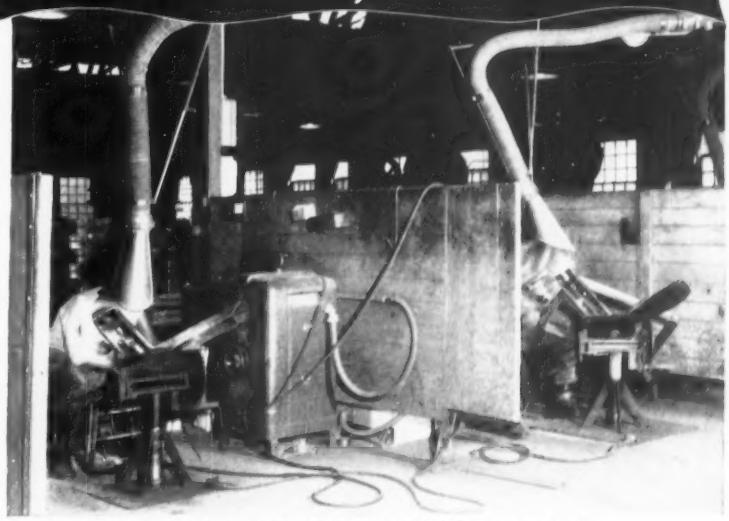
**Chicago** — Somewhat stronger tone in scrap is developing and it is buoying up brokers and dealers who recently have had slim pickings at the bottom of the barrel. So far, however, dealer material hasn't profited much by the better feeling. No. 1 heavy melting steel and No. 1 factory bundles involving industrial material have advanced $1 to $2

(*Please turn to page* 194)

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

THE O. K. TOOL COMPANY, INC.
MILFORD 3, NEW HAMPSHIRE

RUEMELIN *Welding Fume Collectors*



Illustrating Ruemelin Fume Collectors in action. Part of a group of sixteen collectors at plant of Sterling Wheelbarrow Co., Milwaukee.

Collects fumes at the source! Counterbalanced inlet hood stays in working area automatically. Hoods have great lateral and vertical range for table, positioner or floor use. Thousands in every day service. Write for bulletin 37-E.

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MFRS. & ENGRS. • SAND BLAST & DUST COLLECTING EQUIPMENT
3882 NORTH PALMER STREET • MILWAUKEE 12, WISCONSIN, U. S. A.

A-7698-½

# IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

## STEELMAKING SCRAP COMPOSITE

| | |
|---|---|
| Apr. 1 | $24.50 |
| Mar. 25 | 24.33 |
| Mar. Avg. | 24.33 |
| Apr. 1953 | 42.88 |
| Apr. 1949 | 24.06 |

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

### PITTSBURGH

(Delivered consumer plant)

| | |
|---|---|
| No. 1 heavy melting | 25.00-26.00 |
| No. 2 heavy melting | 23.00-24.00 |
| No. 1 bundles | 25.00-26.00 |
| No. 2 bundles | 21.00-22.00 |
| No. 1 busheling | 25.00-26.00 |
| *Machine shop turnings* | *13.00-14.00* |
| *Mixed borings, turnings* | *13.00-14.00* |
| Short shovel turnings | 16.00-17.00 |
| Cast iron borings | 16.00-17.00 |
| Cut structurals | 27.00-28.00 |
| Heavy turnings | 26.00-27.00 |
| Punchings & plate scrap | 27.00-28.00 |
| Electric furnace bundles | 28.00-29.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 35.00-36.00 |
| Charging box cast | 33.00-34.00 |
| Heavy breakable cast | 30.00-31.00 |
| Unstripped motor blocks | 24.00-25.00 |
| No. 1 machinery cast | 42.00-43.00 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt* | *28.00-29.00* |
| Rails, 2-ft. and under | 44.00-45.00 |
| Rails, 18-in. and under | 45.00-46.00 |
| Rails, random lengths | 38.00-39.00 |
| *Railroad specialties* | *33.00-34.00* |

Stainless Steel Scrap

(F.o.b. shipping point)

| | |
|---|---|
| 18-8 bundles & solids | 165.00-170.00 |
| 18-8 turnings | 85.00-90.00 |
| 430 bundles & solids | 85.00-87.00 |
| 430 turnings | 60.00-62.00 |

### CLEVELAND

(Delivered consumer plant)

| | |
|---|---|
| No. 1 heavy melting | 20.00-21.00 |
| No. 2 heavy melting | 18.00-19.00 |
| No. 1 bundles | 20.00-21.00 |
| No. 2 bundles | 15.00-16.00 |
| No. 1 busheling | 20.00-21.00 |
| *Machine shop turnings* | *9.00-10.00* |
| *Mixed borings, turnings* | *14.00-15.00* |
| *Short shovel turnings* | *14.00-15.00* |
| Cast iron borings | 12.00-13.00 |
| Low phos. | 22.00-23.00 |
| Alloy free, short shovel turnings | 13.00-14.00 |
| Electric furnace bundles | 20.00-21.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 37.00-38.00 |
| Charging box cast | 23.00-24.00 |
| Stove plate | 33.00-34.00 |
| Heavy breakable cast | 22.00-23.00 |
| Unstripped motor blocks | 21.00-22.00 |
| Brake shoes | 27.00-28.00 |
| Clean auto cast | 38.00-39.00 |
| No. 1 wheels | 30.00-31.00 |
| Burnt cast | 27.50-28.50 |
| Drop broken machinery | 38.00-39.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt | 25.00-26.00 |
| R.R. malleable | 38.00-39.00 |
| Rails, 3-ft. and under | 41.00-42.00 |
| Rails, 18 in. and under | 44.00-45.00 |
| Rails, random lengths | 37.00-38.00 |
| Cast steel | 32.00-33.00 |
| Railroad specialties | 32.00-33.00 |
| Uncut tires | 34.00-35.00 |
| Angles, splice bars | 38.00-39.00 |
| Rails, rerolling | 38.00-39.00 |

Stainless Steel

(F.o.b. shipping point)

| | |
|---|---|
| 18-8 bundles, solids | nom. 160.00-170.00 |
| 18-8 turnings | nom. 70.00-80.00 |
| 430 clips, bundles, solids | nom. 70.00 |
| 430 turnings | 40.00-50.00 |

### YOUNGSTOWN

(Delivered consumer plant)

| | |
|---|---|
| No. 1 heavy melting | 23.00-24.00 |
| No. 2 heavy melting | 20.00-21.00 |
| No. 1 bundles | 23.00-24.00 |
| No. 2 bundles | 18.00-19.00 |
| *Machine shop turnings* | *10.00-11.00* |
| *Short shovel turnings* | *16.00-17.00* |
| *Cast iron borings* | *16.00-17.00* |
| Low phos. | 25.00-26.00 |
| Electric furnace bundles | 24.00-25.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt | 26.00-27.00 |

### PHILADELPHIA

(Delivered consumer plant)

| | |
|---|---|
| No. 1 heavy melting | 22.00 |
| No. 2 heavy melting | 20.00 |
| No. 1 bundles | 22.00 |
| No. 2 bundles | 18.00 |
| No. 1 busheling | 22.00* |
| Electric furnace bundles | 23.00-23.50 |
| Machine shop turnings | 11.00 |
| Mixed borings, turnings | 11.00 |
| Short shovel turnings | 16.00* |
| Structurals & plate | 26.00-27.00 |
| Heavy turnings | 20.00 |
| Couplers, springs, wheels | 30.00 |
| Rail crops 2 ft & under | 40.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 34.00-35.00 |
| Malleable | 38.00-39.00 |
| Heavy breakable cast | 36.50-37.50 |
| Unstripped motor blocks | 28.00* |
| Drop broken machinery | 40.00 |

*Nominal.

### NEW YORK

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 14.00 |
| No. 2 heavy melting | 12.00 |
| No. 1 bundles | 14.00 |
| No. 2 bundles | 10.00 |
| Machine shop turnings | 4.00* |
| Mixed borings, short turnings | 6.00* |
| Low phos. (structural & plate) | 20.00 |
| Short shovel turnings | 8.00-9.00* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 29.00-30.00 |
| Unstripped motor blocks | 21.00-22.00* |

Stainless Steel

| | |
|---|---|
| 18-8 sheets, clips, solids | 160.00-165.00 |
| *18-8 borings, turnings* | *70.00-75.00* |
| 430 sheets, clips, solids | 40.00 |
| 410 sheets, clips, solids | 30.00 |

*Nominal.

### BOSTON

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 13.25-15.00 |
| No. 2 heavy melting | 9.25-11.25 |
| No. 1 bundles | 13.25-14.25 |
| No. 2 bundles | 7.25-9.25 |
| Machine shop turnings | 3.00-3.50 |
| Mixed borings, turnings | 3.00-3.50 |
| Short shovel turnings | 6.50-7.00 |
| No. 1 cast | 29.00-30.00 |
| Mixed cupola cast | 27.00-28.00 |
| No. 1 machinery cast | 36.00-37.00 |

### CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 22.00-23.00 |
| No. 2 heavy melting | 18.00-19.00 |
| No. 1 bundles | 22.00-23.00 |
| No. 2 bundles | 16.00-17.00 |
| No. 1 busheling | 22.00-23.00 |
| Machine shop turnings | 9.00-10.00 |
| Mixed borings, turnings | 10.00-11.00 |
| Short shovel turnings | 12.00-13.00 |
| Cast iron borings | 10.00-11.00 |
| *Low phos., 18 in.* | *30.00-31.00* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 35.00 |
| Heavy breakable cast | 29.00 |
| Charging box cast | 30.00 |
| Drop broken machinery | 40.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt | 26.00-27.00 |
| Malleable | 32.00-33.00 |
| Rails, 18-in. and under | 42.00-43.00 |
| Rails, random lengths | 34.00-35.00 |

### CHICAGO

| | |
|---|---|
| *No. 1 heavy melting* | *25.00-27.00* |
| *No. 2 heavy melting* | *23.00-25.00* |
| *No. 1 factory bundles* | *27.00-28.00* |
| *No. 1 dealer bundles* | *25.00-26.00* |
| No. 2 bundles | 17.00-19.00 |
| *No. 1 busheling* | *25.00-27.00* |
| *Machine shop turnings* | *10.00-11.00* |
| *Mixed borings, turnings* | *12.00-13.00* |
| *Short shovel turnings* | *13.00-14.00* |
| *Cast iron borings* | *13.00-14.00* |
| *Cut structurals, 3-ft* | *30.00-31.00* |
| *Punching & plate scrap* | *30.00-31.00* |
| Electric furnace bundles | 28.00-29.00 |

Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *35.00-37.00* |
| Stove plate | 27.00-28.00 |
| *Unstripped motor blocks* | *24.00-25.00* |
| Clean auto cast | 36.00-38.00 |
| Drop broken machinery | 36.00-38.00 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt* | *28.00-29.00* |
| R.R. malleable | 39.00-40.00 |
| Rails, 2-ft. and under | 40.00-41.00 |
| Rails, 18-in. and under | 41.00-42.00 |
| Angles, splice bars | 35.00-36.00 |
| Rails, rerolling | 34.00-35.00 |

Stainless Steel Scrap

| | |
|---|---|
| 18-8 clips & solids | 130.00-140.00 |
| 18-8 turnings | 60.00 |
| *430 clips & solids* | *40.00-42.00* |
| *430 turnings* | *20.00-22.00* |

### DETROIT

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 16.00 |
| No. 2 heavy melting | 14.50 |
| No. 1 bundles | 17.00 |
| No. 2 bundles | 14.50 |
| No. 1 busheling | 17.00 |
| Machine shop turnings | 5.00 |
| Mixed borings, turnings | 5.00 |
| Short shovel turnings | 8.00 |
| Punchings & plate scrap | 19.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 36.00 |
| Charging box cast | 25.00 |
| Stove plate | 28.00 |
| Heavy breakable | 25.00 |
| Unstripped motor blocks | 18.00 |
| Clean auto cast | 40.00 |
| Malleable | 28.00 |

### BUFFALO

| | |
|---|---|
| No. 1 heavy melting | 23.50-24.50 |
| No. 2 heavy melting | 20.50-21.00 |
| No. 1 bundles | 23.50-24.50 |
| No. 2 bundles | 18.50-19.00 |
| No. 1 busheling | 23.50-24.50 |
| Machine shop turnings | 11.00-12.00 |
| Mixed borings, turnings | 13.00-13.50 |
| Short shovel turnings | 15.00-15.50 |
| Cast iron borings | 13.00-13.50 |
| Low phos. | 27.50-28.50 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| *No. 1 cupola* | *34.00-35.00* |
| No. 1 machinery | 37.00-38.00 |

Railroad Scrap

| | |
|---|---|
| Rails, random lengths | 31.50-32.50 |
| Rails, 2-ft and under | 36.50-37.50 |
| Railroad specialties | 34.50-35.50 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 heavy melting | 19.00-20.00 |
| No. 2 heavy melting | 17.00-18.00 |
| No. 1 bundles | 19.00-20.00 |
| No. 2 bundles | 15.00-16.00 |
| No. 1 busheling | 19.00-20.00 |
| Cast iron borings | 13.00-14.00 |
| Short shovel turnings | 14.00-15.00 |
| Machine shop turnings | 12.00-13.00 |
| Electric furnace bundles | 25.00-26.00 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 39.00-40.00 |
| Charging box cast | 28.00-29.00 |
| Stove plate | 36.00-37.00 |
| Bar crops and plate | 28.00-29.00 |
| Structural, plate 2 ft | 28.00-29.00 |
| Heavy breakable cast | 28.00-29.00 |
| Unstripped motor blocks | 32.00-33.00 |
| No. 1 wheels | 45.00-46.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt | 23.00-24.00 |
| Rails, 18 in. and under | 39.00-40.00 |
| Rails, random lengths | 32.00-33.00 |
| Angles, splice bars | 35.00-36.00 |
| Stand. steel axles | 35.00-36.00 |

### ST. LOUIS

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 24.00 |
| No. 2 heavy melting | 22.00 |
| No. 1 bundles | 24.00 |
| No. 2 bundles | 19.00 |
| *Machine shop turnings* | *6.50* |
| *Short shovel turnings* | *8.50* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 35.00 |
| *Charging box cast* | *23.00* |
| Heavy breakable cast | 23.00 |
| Unstripped motor blocks | 23.00 |
| Brake shoes | 30.00 |
| Clean auto cast | 37.00 |
| *Stove plate* | *27.50* |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt | 29.00 |
| *Rails, 18-in. and under* | *38.00* |
| *Rails, random lengths* | *33.50* |
| *Rails, rerolling* | *37.00* |
| Uncut tires | 30.00 |
| Angles, splice bars | 33.00 |

### SEATTLE

(Delivered consumer plant)

| | |
|---|---|
| No. 1 heavy melting | 23.00 |
| No. 2 heavy melting | 19.00 |
| No. 1 bundles | 22.00 |
| No. 2 bundles | 16.00 |
| No. 3 bundles | 13.00 |
| Machine shop turnings | 11.50 |
| Mixed borings, turnings | 11.50 |
| Short shovel turnings | 11.50 |
| Electric furnace, No. 1 | 35.00 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| *No. 1 cupola* | *30.00-35.00* |
| *Heavy breakable cast* | *25.00* |
| Unstripped motor blocks | 23.00 |
| *No. 1 wheels* | *21.00* |
| *Stove plate (f.o.b. plant)* | *28.00* |
| Brake shoes | 28.00 |

Railroad Scrap

(Delivered consumer plant)

| | |
|---|---|
| Rails, random lengths | 30.00-34.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 heavy melting | 20.00 |
| No. 2 heavy melting | 16.00 |
| No. 1 bundles | 19.00 |
| No. 2 bundles | 16.00 |
| No. 1 busheling | 20.00 |
| Machine shop turnings | 5.00 |
| Mixed borings, turnings | 5.00 |
| Short shovel turnings | 9.00 |
| Cast iron borings | 9.00 |
| Cut structurals | 25.00 |
| Heavy turnings | 9.00 |
| Punchings & plate scrap | 25.00 |
| Electric furnace bundles | 19.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 39.00 |
| Charging box cast | 35.00 |
| Stove plate | 37.00 |
| Heavy breakable cast | 36.00 |
| Unstripped motor blocks | 29.00 |
| Brake shoes | 35.00 |
| Clean auto cast | 39.00 |
| No. 1 wheels | 39.00 |
| Burnt cast | 23.00 |
| Drop broken machinery | 43.00 |

### LOS ANGELES

| | |
|---|---|
| No. 1 heavy melting | 20.00 |
| No. 2 heavy melting | 16.00 |
| No. 1 bundles | 18.00 |
| No. 2 bundles | 16.00 |
| Machine shop turnings | 5.00 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 35.00-38.00 |

### HAMILTON, ONT.

(Delivered prices)

| | |
|---|---|
| No. 1 heavy melting | $23.00 |
| No. 2 heavy melting | 21.00 |
| No. 1 bundles | 23.00 |
| No. 2 bundles | 18.00 |
| Mixed steel scrap | 18.00 |
| Mixed borings, turnings | 13.00 |
| Rails, remelting | 33.00 |
| Busheling, new factory: | |
| Prepared | 22.00 |
| Unprepared | 18.00 |
| Short steel turnings | 13.00 |

Cast Iron Grades†

| | |
|---|---|
| No. 1 machinery cast | 42.00 |

†F.o.b., shipping point.

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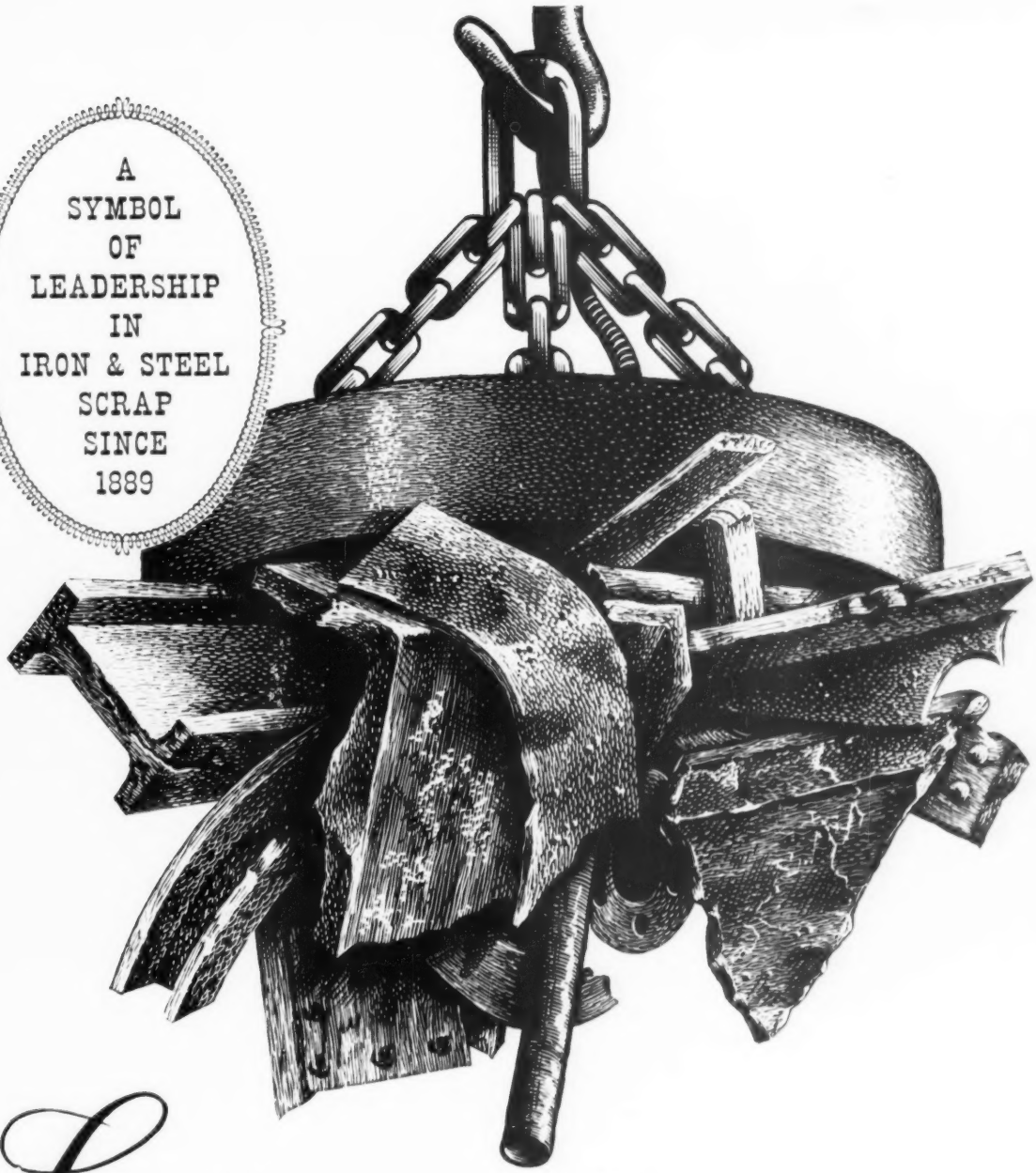

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(Continued on Page 196)

(Concluded from page 191)

per ton, and cast items show a comparable price gain.

**Cleveland** — The slightly firmer tone that appeared in the scrap market about three weeks ago continues in evidence. Sentiment, it appears, is being bolstered by somewhat stronger demand from the foundries for the cast grades and, last week, a substantial sale of blast furnace grades which resulted in an increase of about $1 per ton in that classification. Steelmaking grades, however, are unchanged at levels established a couple weeks back.

**Seattle**—Scrap prices are weak. No. 1 cupola is quoted $30 to $35, electric furnace material, $33, heavy breakable, $25, brake shoes, $28 and stove plate, $28.

**San Francisco**—New business in steel scrap is light, although there has been some movement to a small mill in this area just back in production after a three weeks' shutdown due to major repair work at the plant.

**Cincinnati** There is a feeling of strength in the scrap market even though buying activity has practically stopped. Transactions in low phosphorus raised the price $1 a ton.

**St. Louis** Rail scrap prices show moderate strength as mills move to buy the premium grades at bargain prices. Offerings continue heavy. Other grades stay unchanged to 50 cents higher.

**Los Angeles** Dealers are voicing optimism for the first time in months as mills give indications that their scrap purchases will be increased in the near future.

## Scrap Export Controls Eased

**Washington**—Government controls on the export of iron and steel scrap were relaxed by the Commerce Department effective Apr. 1. Exporters no longer are required to submit a certificate of availability along with export license applications.

Also, export licenses issued after Apr. 1 will be valid for six months, whereas they have been valid for only 60 days.

From Jan. 1 through Mar. 29 the department licensed 183,678 short tons of scrap for export from continental U. S. and 12,715 tons from off-shore possessions. This total of 196,393 tons for almost the full quarter compares with about 280,000 tons licensed in fourth quarter last year. Actual exports in January this year totaled 57,025 short tons of which 11,810 came from continental U. S. and 15,215 from off-shore.

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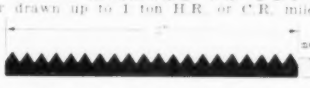
or to have rolled or drawn up to 1 ton H.R. or C.R. mild steel strips, shape as shown




or suitable substitute having sharp one-way continuous or interrupted pattern (e.g. one way diamondette floor plate). Do not offer 4-way floor plate.

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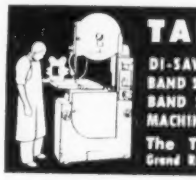

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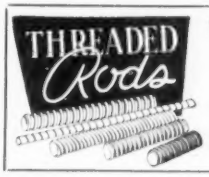


10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
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1 Brand New Yale 4,000# Telescopic Lift Truck. Height 83" Fork Extension 48"—Gas Driven. It has never been used.

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**IMMEDIATE SHIPMENT**
**2" Plates**
520 Tons 2" x 53" x 36'5"
Hot Rolled Mild Steel Plates
**BELOW MILL PRICE**
Also
Plates flame cut from our shop any size and shape, such as, machine bases, machine frames, unusual shapes, weldments, etc. *Let us quote your requirements.*
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FOR SALE
Used — As Is — Reconditioned
**RAILWAY CARS—**
**ALL TYPES**
"SERVICE-TESTED"
**FREIGHT CAR REPAIR PARTS**
For All Types of Cars
**LOCOMOTIVES**
Diesel, Steam, Gasoline
Diesel-Electric
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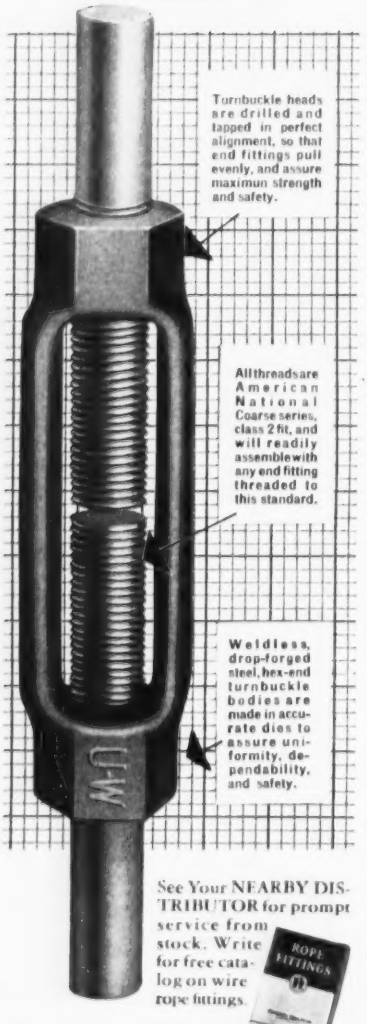
# transformers
**built to your specifications**

Take advantage of our more than 40 years' experience in manufacturing and re-building industrial transformers. *Complete satisfaction guaranteed.*

*Send us your specifications for prompt quotation*
"TRANSFORMER HEADQUARTERS"
Manufactured - Bought - Sold - Repaired
**THE ELECTRIC SERVICE CO., INC.**
5315 Hetzel St., Cincinnati 27, Ohio

# UPSON-WALTON turnbuckles

**ENGINEERED FOR SAFETY**


Turnbuckle heads are drilled and tapped in perfect alignment, so that end fittings pull evenly, and assure maximun strength and safety.
All threads are American National Coarse series, class 2 fit, and will readily assemble with any end fitting threaded to this standard.
Weldless, drop-forged steel, hex-end turnbuckle bodies are made in accurate dies to assure uniformity, dependability, and safety.
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See Your NEARBY DISTRIBUTOR for prompt service from stock. Write for free catalog on wire rope fittings.

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FITTINGS • WIRE ROPE • TACKLE BLOCKS


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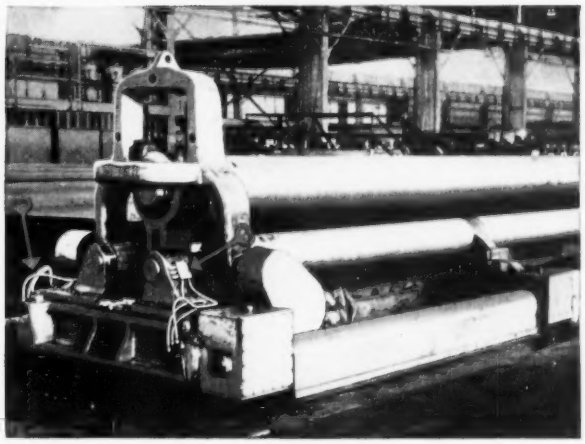
FARVAL—*Studies in Centralized Lubrication* No. 140

# 800 miles of pipe rolled on Baldwin Bending Roll lubricated by Farval



KEYS TO ADEQUATE LUBRICATION—*Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

**FARVAL SAVES ON BENDING ROLL LUBRICATION**

| | Lbs./yr. lube. 62 points | Hrs./yr. lube. 62 points | Annual Cost @ $1.50/hr. 62 points |
|---|---|---|---|
| GREASE GUN | 20,592 lbs. | 717 hrs. | $1,075.00 |
| CENTRALIZED SYSTEM | 5,304 lbs. | 15 hrs. | $ 22.50 |
| ANNUAL SAVINGS EFFECTED BY FARVAL | 15,288 lbs. | 702 hrs. | $1,051.50 |
| COMBINED SAVING (LABOR AND LUBRICANT) | | | $2,579.50 |

AND IN ADDITION, FARVAL SAVES BEARING EXPENSE AND PRODUCTION TIME

Reports of lubrication engineers show lubrication by grease gun takes .747 minutes per point—to clean dirt from nipples, grease, move from point to point, and refill gun. With Farval it takes only 15 minutes every fourth day to refill Farval reservoir. In addition, Farval saves 3 pounds of each 4 of lubricant used by other methods.

THIS first of a new type bending roll formed over 800 miles of 24″ and 30″ O.D. pipe its first operating year. At work in a large southern pipe mill, it shapes 31½ foot lengths of 78″ and 97″ skelp at rolling speeds up to 60 feet per minute.

To insure that the new design features for increased production would not be hamstrung by old-fashioned hand lubrication, the machine builder equipped the bending roll with Farval centralized lubrication.

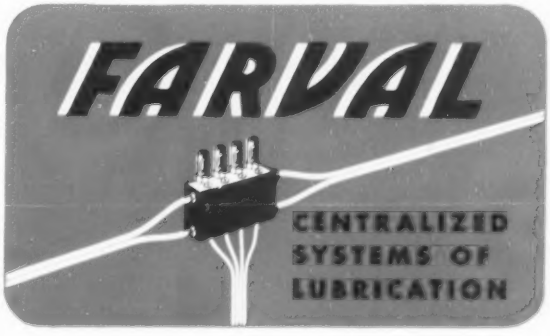
At a single stroke Farval lubricates 62 main bearings on which depends the rugged job of shaping skelp. No stopping for time-consuming hand oiling! Lubricant savings run as high as 75%.

Farval is the original Dualine system of centralized lubrication that delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Indicators at every bearing tell that each valve has functioned.

Machinery builders and customers alike recognize that Farval centralized systems of lubrication save time, money and lubricant, as well as eliminate bearing expense and increase machine production.

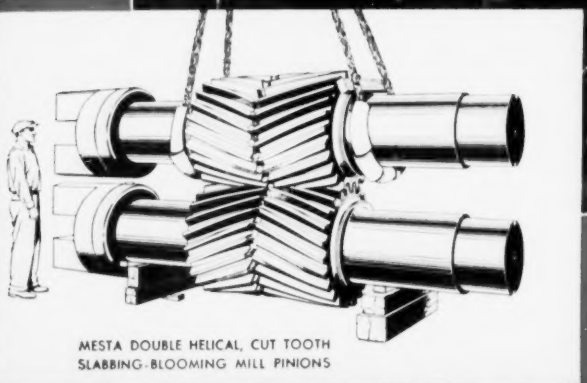
There are Farval systems for your machines, big or small, with proportionate savings. And there's a Farval engineer near you, ready to solve your lubrication problems. Write for full details. Send for Bulletin 25 today. The Farval Corporation, 5270 East 80th Street, Cleveland 4, Ohio.

*Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.*



# MESTA

## MODERN REVERSING SLABBING-BLOOMING MILLS



MESTA DOUBLE HELICAL, CUT TOOTH SLABBING-BLOOMING MILL PINIONS

MESTA 46" TWO-HIGH REVERSING SLABBING-BLOOMING MILL

*Designers and Builders of Complete Steel Plants*

**MESTA MACHINE COMPANY**

PITTSBURGH, PENNSYLVANIA